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NEW SHIPS FOR THE GREAT LAKES.

Readers of the Review will be interested in knowing how the twenty-three new steel vessels for which the American Ship Building Company has contracts are divided among the different yards of the consolidation. Contracts for all kinds of auxiliary machinery, and in fact for almost everything entering into these vessels, have been and are being made in bulk at the Cleveland headquarters of the big company. Of the twenty-three vessels only one is for passenger service, and only three of the freight carriers are tow barges. All the rest are steamers, and it may be interesting to note also that of the steamers all but three are of the very largest kind, 6,000 to 8,000 gross tons capacity, and fitted in most cases with quadruple expansion engines and water tube boilers, the latter of Babcock & Wilcox type. Some of these vessels will not, of course, go into commission until very late next season. They are divided among the different yards of the American company as follows:

Chicago Ship Building Co.—Three steamers and three barges. Two of the steamers are for Carnegie interests and one for John D. Rockefeller. Two of the barges are for the Minnesota Steamship Co. and one for Carnegie interests. All these vessels are for the ore trade and are of the largest class.

Detroit Ship Building Co.—One passenger steamer for Detroit and St. Clair river service; one freight steamer for Alex McVittie and others of Detroit (Admiral), which has been launched but not yet completed; two freight steamers, largest class, for Eddy Bros. of Bay City, Mich.; one freight steamer, largest type, for Carnegie interests.

Loraln works of American company.—Two steamers, largest type, for American Steel & Wire interests, represented by A. B. Wolvin of Duluth; two similar steamers for Carnegie interests; one 3,000-ton Welland Canal size steamer for R. R. Rhodes of Cleveland.

Globe works of American company, Cleveland.—One freight steamer, large type, launched but not yet completed (Wm. E. Reis), for John Mitchell of Cleveland; one steamer, large type, for John D. Rockefeller; two 3,000-ton steamers, Welland canal size, for American Steel & Wire interests, represented by A. B. Wolvin of Duluth.

West Bay City works American company.—Two very large steamers for American Steel & Wire interests, represented by A. B. Wolvin of Duluth.

Superior Ship Building Co., West Superior, Wis.—One steamer, largest type, for John D. Rockefeller.

In addition to the foregoing list of orders under way at the consolidated yards, there is building at the works of the Union Dry Dock Co., Buffalo, a package freight steamer of the largest type for the Lehigh Valley Transportation Co., and at James Davidson's yard in West Bay City, Mich., a wooden schooner, which latter will very probably be followed by one or more wooden vessels during the winter. The Craig Ship Building Co. of Toledo has well along towards the launching stage a 3,000-ton steel steamer for Arthur Hawgood and others of Cleveland, and as noted recently has begun work on a small passenger steamer for the Arnold Transportation Co. of Mackinaw, Mich. The Arnold steamer will be 200 feet over all, 34 feet beam and about 14 feet hold. She will have two decks and a commodious cabin finished in mahogany. Engines will be triple expansion of about 1,600 horse power, built after navy practice and intended to insure a regular speed of 18 miles an hour. This vessel is to be completed about July 1 next.

Work on the second dry dock at the West Superior yard of the American Ship Building Co. is so well along that it is hoped a vessel will be docked before severe weather sets in. The principal work yet to be done is in the approach to the dock. This new dock is 606 feet long, 106 feet 8 inches wide and 24 feet 4 inches deep.

SHIPPING RELATIONS WITH CUBA AND PORTO RICO.

Mr. Frye, chairman of the senate committee on commerce, has introduced a bill relative to Cuban shipping and also measures providing for the extension of United States laws relative to commerce, navigation and merchant seamen to the Hawaiian islands and Porto Rico. The bill relating to Cuban shipping provides that vessels hailing from the island shall be entitled in United States ports to the rights and privileges extended to the most favored foreign nation. The bills relating to the Hawaiian islands and Porto Rico indicate the intention to regard these islands as part of the territory of the United States, at least in so far as their commerce and navigation interests are concerned. The commissioner of navigation is authorized to make regulations for the nationalizing of all vessels owned by subjects of the Hawaiian islands and Porto Rico on April 11, 1899, and which have been continuously so owned to the date of nationalization. The coasting trade, it is provided, shall be regulated in accordance with the provisions of the law applicable to such trade between any two great coasting districts.

The steel steamer Plymouth of Boston has been purchased by the United States light-house board for $80,000. The Plymouth, it will be remembered, was the vessel used as a tender for Sir Thomas Lipton's yacht Shamrock during the international races. The vessel has been taken to the light-house department docks at Tompkinsville, S. I., where she will be overhauled and remodeled.

Emperor William, by reason of his interest in everything pertaining to the German navy, is making a full investigation of the subject of wireless telegraphy. He recently spent five hours listening to an address on the subject delivered at the High School of Technology at Berlin by Prof. Slaby.

RECORD OF THE YEAR IN MAINE SHIP BUILDING.

Much has been printed during the past year regarding the revival of the ship building industry along the coast of Maine, and as the year draws to a close, enabling a summing up of the operations of the various yards, it appears that these reports are not of an exaggerated kind. In wooden ship building the increase is, of course, very remarkable, but more interesting is the manner in which Maine is coming forward as a producer of steel craft of the highest class, both for the navy and merchant marine. There have been launched in the yards of the state since Jan. 1 of the present year new vessels aggregating over 50,000 net registered tons and valued at fully $3,000,000. There are now under contract or on the stocks vessels aggregating fully 52,000 tons, with a total valuation of $4,000,000. The building operations for the year have been confined for the most part to four districts—Bath, Belfast, Waldoboro and Machias.

The prospects for the year 1900 are brighter than they have been for a long time past. At the Bath Iron Works there are now being built naval vessels to the amount of 7,991 tons displacement. Percy & Small have a five-masted schooner of 2,300 tons on the stocks, to be launched in February or earlier, and will then begin work on a five-master of 2,500 tons and a six-master of 5,000 tons capacity. The New England Co. of Bath, will build three or more barges within the next few months, and have contracts for a 2,000-ton schooner and one of 1,000 tons. Gardiner G. Deering will build a five-masted schooner of 2,000 tons. Kelley, Spear & Co. have contracted to build two barges of 850 tons each and a four-masted schooner of 1,600 tons. William T. Donnell will build a four-master of 1,000 tons.

In the Waldoboro district business promises well for 1900. At Rockland, Cobb, Butler & Co. are building a three-masted schooner of 550 tons for the hard pine trade, and I. L. Snow & Co. are to build a center-board schooner of 200 tons. At Thomaston, Washburn Bros. are building a four-masted schooner of 1,100 tons, to be launched in January; have laid the keel of a three-masted schooner to be launched in the spring, and are getting out the frame for a 1,600-ton four-master to be built next summer. At Waldoboro, George L. Welt will build a five-masted schooner of 1,800 tons for William F. Palmer of Boston.

In the Belfast district, at Camden, there is now on the stocks a five-masted schooner of about 1,400 tons to be launched in January. There are under contract at Camden a five-master of 1,800 tons and a marine marvel—a six-masted schooner, the first ever built and the largest fore-and-aft rigged vessel ever designed for salt water. She is to register 3,000 tons gross and about 2,750 tons net, and will carry about 5,500 tons of coal. At Belfast the Pendleton Bros. of Islesboro and New York, will build a duplicate of their 762-ton four-master, Pendleton Bros. recently launched from Carter's yard.

BATH LEADS IN SHIP BUILDING.

Washington, D. C., Dec. 20.—It may surprise some people in shipping circles to learn that Bath, Me., is again as preeminently the ship building city of the new world as she has ever been. That, nevertheless, is the fact. During the fiscal year which ended June 30, 1899, Bath built more tonnage (merchant vessels, of course) than any other customs district in the United States; and more, she built more tonnage than was turned out in any whole state outside of Maine. Only three districts in the United States turned out more than 20,000 tons of vessels. They were:

District.	No. of vessels.	Gross tons.
Bath	43	46,693
Philadelphia	37	37,625
Cuyahoga (Cleveland)	13	34,467

The district of Cuyahoga, which ranks third, is that in which Cleveland, the principal ship building city of the great lakes, is located. In all there were built in the United States during the year 1,273 vessels of 300,038 tons gross register. In proportion to population Bath, Me., is the leading ship owning city of America, there being 12 tons of shipping per person owned in that city. Duluth comes next with 5.3 tons per person. The total number of vessels owned in this country is 22,728, with an aggregate gross tonnage of 4,864,238.

NEW PLANT LINER.

The Plant system will shortly have a valuable addition to its fleet of steamers in the H. B. Plant, now nearing completion at the works of the Merrill-Stevens Engineering Co., Jacksonville, Fla. The vessel, which is designed for service on Tampa bay, is of steel construction, 130 feet in length over all, 22 feet beam, and fitted with inclined Corliss engines and a Scotch boiler of 300 horse power. She will have accommodations for upwards of 400 excursionists, the saloon being 21 by 55 feet in size. The draught is only 3 feet. The H. B. Plant is, of course, a side wheeler. Her speed will be about 12 miles per hour. This vessel was designed by Mr. A. D. Stevens of the Merrill-Stevens Engineering Co., and her builders have every confidence that under actual service conditions she will be as fast as either the Margaret or La Grande Duchesse. She will be lighted throughout with electricity, fitted with all modern improvements and will cost, when completed, in the neighborhood of $30,000.

The torpedo boat Stringham, building by the Harlan & Hollingsworth Co., Wilmington, Del., has received the repairs to her machinery necessitated by a recent mishap, and after a brief sojourn in dry dock will resume her trial trips.

A GREAT SHIP YARD.

RAPID DEVELOPMENT OF THE NEW WORKS OF THE NEW YORK SHIP BUILDING COMPANY AT CAMDEN, N. J.

Probably never in the history of American ship building, or indeed ship building anywhere, has a modern plant been installed with the rapidity that has characterized the upbuilding of the new yard of the New York Ship Building Co. at Camden, N. J. This is all the more remarkable in view of the fact that almost every part of the work has been hindered more or less by difficulty in securing adequate quantities of material. A tract of land which two months ago was largely under water and partly occupied by farm crops and a village of ramshackle boat houses is now a hive of industry in which 600 men are busily engaged.

The steel framework of a considerable portion of the main shop for working up hull material is already in place. On the upper floor of this building will be located the mold loft. This building is to be joined at once on the west and south by the framework of the boiler shop, the machine shop and foundry, the whole making one massive structure 1220 feet in length. These buildings will be 250 feet in width and 70 feet high. To the northwest of this structure the masons have about completed foundations of the joiner and wood working shop, which is to be of brick, 200 feet in length and 60 feet wide. So rapidly has the work been pushed that part of the foundations of this latter building were laid under water. Pile drivers are at work on the construction of the ship ways and dredging is constantly in progress. One of the buildings of the plant is practically completed. This is the two-story brick structure in which will be provided quarters for the clerical force and draftsmen. The delivery of tools has already commenced. Shears, punches, lathes and drill presses are already on the ground. The work being done for the New York company by Armstrong & Printzenhoff constitutes one of the largest contracts of the kind ever executed in this country. It embraces the construction of three ships' ways, a deep water basin, two piers and considerable miscellaneous work. Four pile driving machines and a force of 150 men are putting down into the bed of the river a total of 140 piles per day. It is understood that the present contracts held by the firm mentioned will be practically duplicated later on when the New York company is prepared to undertake the enlargement of its works.

DISPOSITION OF THE PARIS.

The recent trip of President C. A. Griscom of the International Navigation Co. to England is understood to be in connection with the disposition of the wrecked American liner Paris. It is quite possible that the vessel may again be placed in service on her old route. A meeting of interests at Lloyds' was recently held to consider the action brought by the International company against the Commercial Union as the leading insurance company for the payment of a total loss under the policies. At this meeting a proposition was made which it is understood is satifactory to the International Navigation Co., but nothing definite can be determined until Mr. Griscom has returned to this country and presented the matter at a meeting of the board of directors of the company.

It is understood that at the conference above referred to the underwriters on the original all risk policies agreed to settle at 55 per cent and pay their proportion of the salvage charges which will, of course, be heavy. On the total loss risk the underwriters agreed to settle on 47½ per cent and pay no salvage charges. From the propositions made it would seem that according to the general estimate something like 50 per cent of her original cost will be required to again put the Paris in condition for service.

A cablegram received since the above item was written states that the difficulties connected with the adjustment of insurance on the Paris have been settled and that the vessel will be turned over to Harland & Wolff of Belfast, Ireland, for repairs. When she resumes her place in the transatlantic service a year hence she will be renamed after an American city.

NEW LINERS UNDER THE SUBSIDY BILL.

A most important project having for its object the establishment of direct steamship communication between the United States and Russia is talked of in connection with the American shipping bill, but it is unfortunate that no names are given in connection with the proposed company. The plan is to establish regular lines of steamers between New York and St. Petersburg and between Vladivostock and some point on the Pacific, probably San Francisco. Both Russian and American capital is said to have been subscribed liberally for the enterprise and it is claimed also that a subsidy will be forthcoming from the Russian government. It is claimed that according to the present rate of exchange $3,060,000 has been raised in Russia and $1,500,000 in the United States for the project, and that at the outset at least eight vessels of 6,000 tons will be chartered. These will fly the Russian flag. If the subsidy bill is passed by congress it is planned to build several large liners in the United States that will carry the American flag. When the American vessels are completed the chartered vessels will be released and the whole fleet will then be American.

A new roller or revolving boat which Walter Dean of Toronto, Canada, is building for Mr. Shaw of Lake Rosseau, representing a syndicate, has reached the launching stage and will be put into the water within a few days. This newcomer in the field of freak vessels is a cigar-shaped craft about 30 feet in length. The screw consists of a cylinder about one-half the length of the boat, situated in the center and passing entirely around the hull proper. This cylinder is supplied with fins or wings running diagonally around from one end to the other, and their rotation gives motion to the hull. The keel, connected at both ends to the hull proper, hangs below the revolving cylinder.

SHIP BUILDING ON THE GREAT LAKES.

Referring to the efforts being made in congress for the abrogation of that clause of the treaty of 1817 which prevents the construction of war vessels on the great lakes, the Army and Navy Register says editorially:

"We do not imagine that the resolution which has been thus early presented in the house by Mr. William Alden Smith will accomplish very much in the direction desired, but it serves to bring up again a matter which should be speedily settled in the interests of certain lake shore industries and for the development of the ship building resources of this country. Mr. Smith's resolution calls upon the secretary of state, with the usual phraseology which permits discretion, for an account of the 'status of the agreement between the United States and Great Britain said to prohibit the building, arming, or maintaining of more than a single war vessel on the great lakes, such information to include all data bearing upon the subject now in the possession of the department.' For many years the facilities for naval ship construction have been somewhat proscribed by a venerable and useless treaty stipulation entered into in 1817 by this country and Great Britain. The situation at that time made such an arrangement of importance to the two countries, which were parties to the convention, and there was abundant reason why such a compact should be made, but all that has been changed, and it is now no longer necessary to insist that either the United States or England shall refrain from building war vessels on the great lakes. There are several concerns which are so situated, and there have been instances when it would have been to the decided advantage of this government to have been able to award contracts to firms which were ruled out of any competition by the old treaty prohibition. It is not within the province of the house, of course, to accomplish anything in the direction of modifying or amending the treaty, and perhaps such a resolution as Mr. Smith has submitted would only impede the efforts which are being made by this government to remove the restrictions imposed by the treaty of 1817. The diplomatic endeavors in that direction have progressed materially, and unless they are blocked by meddlers there is a good chance that the lake ship builders will have an opportunity to compete for the next cruiser contracts."

USING AIR BAGS ON A SUNKEN WRECK.

Capt. Frederick C. Miller, who formerly commanded the Red D line steamer Valencia, has been in charge of the effort to raise by means of bags of compressed air the steamer Macedonia, which lies in the ocean about six miles off Seabright, N. J. The Macedonia is a new German vessel. Last June, while homeward bound from Havana with a cargo of sugar, she was run into by the Old Dominion liner Hamilton and sank in a few minutes. The stem of the Hamilton cut into her as far as the hatch covering, making a gash 15 feet in depth, 10 feet wide at the top and one foot at the bottom. This is abaft the engines, but they and the boilers are intact. The ship lies in pretty deep water, but she is on a hard gravel bottom and there is no suction to hold her down.

Capt. Miller has rented from the Mineralized Rubber Co. of New York city, the rubber bags made for the United States government under the supervision of Lieut. Hobson and with which he raised the sunken Spanish cruiser Maria Teresa. Each of these bags is 15 feet long by 8 feet wide and 5 feet depth and has a lifting capacity when inflated of 15 tons. In conjunction with these, canvas bags are being used. These latter are designed to furnish the ultimate lifting power, it not being desired to risk the lives of the divers when the buoyancy of the vessel is near the rising point. Three compressors on lighters are used for inflating the bags. Before beginning work on the Macedonia, Capt. Miller secured an agreement from the insurance companies interested to make no claim in case he succeeded in raising the vessel. Capt. Miller has also been engaged by the Standard Oil Co. to employ the compressed air bags on the steamer Maverick, sunk in Halifax harbor. Wreckers have raised her twice but lost her each time.

LAUNCH OF THE PENNSYLVANIA.

The management of the Roach ship yard at Chester, Pa., has received high commendation for the new steamer Pennsylvania, which was launched last Saturday. The vessel is building for the New York, Philadelphia & Norfolk Railroad Co. and will be utilized to transfer passengers from the terminus of the railroad at Cape Charles to the hotels at Old Point Comfort and to the city of Norfolk, Va. The new steamer replaces the Cape Charles, which was burned early in the year, shortly after her acceptance by the company. The Pennsylvania is 258 feet 6 inches in length, 36 feet 9 inches beam, 40 feet beam over all, and 16 feet depth. She is of steel and is fitted with six watertight bulkheads and four trimming tanks. She has three decks—main, saloon and promenade. The vessel will be fitted with a Williamson steam steerer, and a hand steering apparatus will also be fitted. The equipment includes also four Hyde capstan-windlasses, and there will be two General Electric engines and dynamos. The interior finish is in white and gold. The dining saloon on the main deck aft of the engine room provides accommodations for sixty-eight pasengers. There are seven state rooms and a ladies' parlor on the saloon deck amidship. The steamer will be equipped with four metallic life rafts.

The engines are of the vertical inverted four cylinder triple expansion type (two of them) with cylinders 18, 29, 33 and 33 inches diameter and 26 inches stroke. The crank shafts are steel forgings, 9 inches in diameter, forged in two sections, and propellers are of manganese. There are two cylindrical condensers, two air pumps, two circulating pumps, two feed pumps, one donkey feed pump, one sanitary, one bilge and one fire pump. For furnishing forced draft there are two blowers. Steam is furnished from six Almy water tube boilers, having an aggregate grate surface of 242 feet. The working pressure is 250 pounds. The Pennsylvania is designed for a speed of at least 20 miles an hour.

The steamer State of Kansas, belonging to the Memphis & Cincinnati steamship line, was burned to the water's edge a few days ago while lying at the wharf at New Madrid, Mo. The loss is estimated at fully $50,000.

ALL THE NEWS OF THE NAVY.

INTEREST AGAIN AROUSED IN PROPOSED GOVERNMENT ARMOR WORKS—A NAVAL ENGINEER'S OPINION OF THE TURBINE VESSELS—OTHER WASHINGTON MATTERS.

WASHINGTON OFFICE MARINE REVIEW, 1345 PENNSYLVANIA AVE, WASHINGTON, Dec. 20, 1899.

Congress will devote considerable attention to that part of the report of the secretary of the navy which relates to the establishment of a factory for the manufacture of armor plate. There is a general agreement that the new ships shall be constructed with the best armor obtainable. Since the revival of the subject there have been many calls for the report of the armor factory board which was transmitted to congress on Dec. 6, 1897, making a comprehensive statement on the subject with specifications and estimates for such an establishment. The factory board estimated that the cost of a plant having a capacity to manufacture 6,000 tons a year of nickel steel, face-hardened and reforged armor would be, exclusive of land for a site and of freight on building material or expense for piling foundations, but including an open hearth department for the production of nickel steel ingots, $3,747,912.11. It is said that owing to the market increase in the cost of structural material since the date of the factory board's report the estimate given should be increased not less than 30 per cent, bringing the estimated cost now up to $4,872,285.74. It is declared that the cost of a plant to produce Krupp armor would not materially differ from one to make Harvey armor, as all the principal features are common to both, but the output of Krupp armor would be less than that of Harvey armor. It would probably be 5,000 instead of 6,000 tons.

One feature of the report which causes concern among those who are really anxious to establish a government factory is the following: "A government armor factory not connected with an establishment engaged in other branches of the steel industry would depend for its success and economic administration upon constant demand for an output nearly approaching its full capacity. If the government should establish an armor factory the efficient and economic maintenance of working of that factory would necessarily depend upon a constant yearly appropriation for ships to be provided with armor, because the armor produced at any time must be specially designed for and fitted to those ships. Any failure to appropriate for such ships in one year would require the cessation of work and the laying off, indefinitely, of the skilled experts and laborers that had been trained to this industry. A resumption of work at a later period would require the training, at a considerable expense, of a new set of men. In the meantime the progress of the art would perhaps have been such that difficult and radical changes would be required, which under continuous working might have been gradually and easily made."

The only government armor factory which the American government has information of is the Russian plant at Kolpino, near St. Petersburg, known as the Tjora Iron Works, but from the fact that Russia buys armor in the United States it is inferred that this factory does not meet the requirements of the Russian service.

ENGLISH TURBINE DESTROYERS.

Lieut. Harold P. Norton of the navy, who is inspector of machinery for the United States cruiser Albany at the Armstrong ship yards, Newcastle-on-Tyne, England, has been having a hard time trying to get some detailed information about the torpedo boat destroyers Turbinia and Viper, which have been advertised as the most wonderful vessels ever designed in regard to speed. He was permitted to inspect the engine and the boiler rooms of the Turbinia, but not to see them while the vessel was running, and he had to be satisfied with walking around the outside of the building where the turbines for the destroyers were being built. He was not even allowed to look through the doors. Lieut. Norton was promised by Mr. Parsons, the inventor of the turbines, that he should have a chance to witness a run of the Turbinia or one of the large boats, but the promise was subsequently withdrawn. Lieut. Norton managed to get considerable information, however, which is contained in a report to the engineer-in-chief of the navy. The turbines, he says, are placed very low down in the Turbinia and all the platforms are above them and very much cramped. The heat being all below the platforms, makes the engine rooms very uncomfortable. He was informed that it was almost unbearable. The air pump is driven by an ordinary steam engine, which is not of good design, and whenever the boat has been in use it has caused a great amount of trouble. The thrust is taken up in collars instead of the turbine case, working in an oil bath with forced lubrication. There is a small Worthington pump, the same as used in the United States service launch, for circulating the oil and keeping it cool. The turbines will not reverse and this difficulty has caused some accidents in the case of the Turbinia, as it is impossible for her to go astern. Lieut. Norton had a chance to examine the boiler very carefully and he expresses the opinion that a large part of the success of the Turbinia is due to her having a boiler that could furnish all the steam that the turbines could use and considers that nearly as good, if not quite as good, results could have been obtained with the same boiler and a well-balanced reciprocating engine. Mr. Parsons furnished some figures about the Turbinia, in part as follows: Total weight of engines, 3 tons 13 hundred weight; total weight machinery and boilers, screws, shafting, tanks, etc., 22 tons; weight of hull, 15 tons; coal and water, 7½ tons; total displacement, 44½ tons; maximum mean speed on the measured mile, 37.76 knots; speed maintained for four consecutive hours, 34 1-3 knots; calculated propulsion horse power at 32 knots, 980.

Lieut. Norton includes in his report a letter from Mr. Parsons containing a comparison of the United States destroyers now building and the two British turbine destroyers. "I notice that in the United States destroyers," says Mr. Parsons, "a horse power of 8,000 is specified with a total weight of heading of 190 tons. In our destroyers we have guaranteed 9,500 and expect to reach 12,000 with total weight of heading 160 tons. Our boilers are about 10 per cent net less both in heating and grate surface than yours. The displacement of our destroyers will be about 310 to 320 tons."

PROPOSED PACIFIC CABLE.

The naval project for a Pacific cable connecting San Francisco, Honolulu, Guam, and the Philippines gives greater promise of practicability than other plans suggested to congress for facilitating commercial and military communication in that ocean, and the bill embodying its features and authorizing its construction and maintenance, which has been introduced by Senator Hale, is likely to become a law. The only cable surveys of a route across the Pacific have been made by the navy and they have enabled the naval authorities to count the cost of the enterprise and its feasibility with confident accuracy. The army scheme for a cable to remain always a military line has been planned wholly on theoretical considerations involving a mid-ocean landing place on a coral rock frequently submerged each year during the stormy season. The private cable companies, which have been rivals in seeking government aid, have made no surveys and their projects have savored strongly of speculation at government expense. The principal private company asks congress to give it a charter and guarantee a subsidy of $400,000 annually for twenty years. During that period it offers to carry government messages free and thereafter will charge the government one-half commercial rates. Under this plan the government would pay out $8,000,000 and in the end the company would have the cable and could sell it to England, Germany, Russia or Japan. The naval project is for a $10,000,000 cable plant, including submarine lines, stations and equipment, to be all laid by regular naval officers and vessels, and to be delivered when completed to the postmaster general, who will manage, operate and maintain the service in the same manner as the postal system with a simple regard for the public interest. In explanation of the appropriation called for it is said by Rear Admiral Bradford, who has had charge of the matter, that $1,000,000 is the estimate of cost of maintenance for the first year, after which the post office department could pay the expenses out of its receipts.

COALING VESSELS AT SEA.

It is generally admitted that the recent tests of machinery developed by the Lidgerwood Mnfg. Co. of New York have demonstrated the practicability of coaling vessels at sea. The report of the inspection board conducting the trial with the cruiser New York and the collier Cassius is favorable to the system, while the report of the commanding officer of the New York is even more commendatory. The board found that the appliances for moving the coal worked admirably and that the claim of the inventors were fully sustained. It has been found, however, that the appliances in some respects were too light and that perhaps it would be better to have them made of heavier steel if the navy adopts the system. While the matter of coaling ships at sea has been experimental for years it was never believed that any apparatus would be found that would transfer coal from collier to warship much faster than the vessels were burning it. One expense of the system is that should the collier accompany a war vessel a long distance it would burn as much coal as it would supply the warship. The present system is unquestionably the best yet presented to the navy department and worked to the satisfaction of the officials. There is not, however, great necessity for colliers with naval ships on long voyages, except in time of war, owing to the establishment of outlying coaling stations and the admirable system of coal deposits along the coast. Admiral Bradford is said to be rather opposed for the present to adopting the invention, although it may be accepted considering the trouble and expense of the inventors in bringing it to its present state of perfection.

BILLS IN CONGRESS.

Among bills introduced in congress are the following: That the secretary of the navy be directed in the selection of names for naval vessels to give the names of states only to battleships and cruisers of the first class; authorizing the secretary of the treasury to establish a life saving staion at or near Bogue inlet, North Carolina, in such locality as the general superintendent of the life saving service may recommend; authorizing the secretary of the treasury to construct a new revenue cutter of the first class to be stationed at Newport, R. I., the price of the cutter not to exceed $200,000. A bill authorizing the construction of a cruiser to be named the Charleston to replace the vessel recently sunk off the Philippines was also introduced in the house last week.

NEW TYPE OF ICE VESSEL.

With the present day interest in the subject of ice crushing or ice breaking vessels it is to be expected that many modifications of the idea will be brought forward. The latest idea, that of an ice crusher to be attached to the prow of a steam vessel, for use as a drilling machine. is a product of the ingenuity of Mr. Warrington Baden-Powell, an Englishman, brother of Sir George Baden-Powell, M. P., and Col. Baden-Powell, now making a creditable record in South Africa. The new ice-crushing craft will resemble an ocean whaleback, the deck covering being of steel studded with heavy rivets, the whole welded to withstand extreme temperature. At the apex of the bow will be fitted a curious screw, somewhat resembling a circular saw, and this will project several feet, partially out of water. At the end of the shaft is a massive point which can be operated as a ram. The idea, of course, is to send the craft against the ice under a full head of steam, the screw at the bow working simultaneously with the propeller at the stern. The former will be electricaly propelled. The propeller will be driven by triple expansion engines of 1500 horse power. Oil fuel will be used. The dynamo for supplying the electrical power for the screw forward will be driven by the main shaft.

The Nickel Plate road on Dec. 17, 1899, will inaugurate a new through vestibuled sleeping car service, leaving New York City via Delaware, Lackawanna & Western Railroad at 11:45 p. m. and arriving in Buffalo at 12:10 noon, connecting there with train No. 5 on the Nickel Plate road, arriving in Chicago at 7:20 a. m. Also, No. 6 leaving Chicago at 10:15 p. m., and arriving in Buffalo at 4:55 p. m., will carry a through vestibuled sleeper, arriving in New York via the Delaware, Lackawanna & Western Railroad at 7:25 a. m. 185-Dec. 21

PROFITABLE YEAR FOR UNDERWRITERS.

A SEASON ON THE GREAT LAKES IN WHICH UNDERWRITERS ESCAPE WITHOUT THE PAYMENT OF A SINGLE TOTAL LOSS OF A MARINE KIND—ONLY A FEW FIRE LOSSES—DEPARTED VESSELS WERE ALL OF THE UNINSURED KIND.

Marine underwriters will remember the season just closed on the great lakes as the most fortunate they have ever experienced. The underwriters have not been called upon to pay a single total loss of a marine kind. They paid two or three total losses that were due to fire, but no total losses involving marine insurance. In the small list of total losses it will be noted that the vessels were almost without exception of a kind on which no insurance could be secured. In this matter of light losses, the season is the most remarkable in the history of lake navigation, especially in view of the high freights that prompted the operation of a large number of vessels long after the expiration of insurance. Losses due to the stranding of steel vessels in connecting waterways of the lakes, which are usually largely in excess of the total losses, on account of expensive bottom repairs, were also lighter than in any year for probably ten years past. The months of October and November seldom pass without a couple of heavy storms, but this year there were not half a dozen days during which navigation was interfered with by heavy weather. The insurance companies were also very fortunate from another standpoint. With very liberal policies and low rates they suffered heavy losses in 1898. This year limitations of various kinds were placed in the policies and rates increased. The number of vessels on which insurance was refused entirely, or on which rates were placed so high as to be prohibitive, was also increased. Requirements as to vessels carrying grain were also of a kind that furnished more protection to cargoes and at the same time made the ship a better risk. As a result the season started off with a minimum of loss on the big fleet that took grain from Chicago to Buffalo in the spring and everything afterward seemed to turn in favor of the insurance companies.

The following tables have no reference whatever to partial losses or to what are known as constructive total losses, namely, such cases as involve practically an entire loss but which invariably result in the rebuilding of the vessel. The tables relate only to vessels that have actually passed out of service.

LOSSES ON THE GREAT LAKES—VESSELS THAT HAVE ACTUALLY PASSED OUT OF EXISTENCE DURING PAST FIVE YEARS.

Year.	Number.	Capacity, gross tons.	Approximate value.
1899	33	17,955	$ 307,600
1898	64	46,670	1,203,200
1897	35	21,450	372,000
1896	35	21,435	380,500
1895	63	48,975	1,200,000

A very interesting story about Porteus of mythology, one of the gods of the sea for whom an organization of New Orleans that takes a prominent part in the Mardi Gras is named, has been sent out from the office of Horace See, naval architect of New York, in connection with the launch of the steamer Proteus at the works of the Newport News company. The Proteus is a sister ship of the Comus, launched Nov. 9, and which was fully described in the Review.

REPORTS REGARDING FOUR MORE MORGAN LINERS.

In answer to a telegram from the Marine Review, President C. B. Orcutt of the Newport News Ship Building & Dry Dock Co. said that officers of the company are not as yet at liberty to talk regarding the contract for four more Morgan liners, which, according to press despatches sent out from Newport News, has been closed within the past few days. It will be remembered that the Newport News company has within the past six months completed four large modern steamers for the Morgan line. The vessels now spoken of will, it is said, be of the same general design. They will be, according to rumor, 406 feet over all length, 48 feet beam, molded, 33 feet 9 inches depth, molded, and of 4,660 tons burden. The cost of the new vessels is reported as about $600,000 each, making the aggregate amount of the contract $2,400,000. After names had been selected for the four Morgan liners built at the Newport News yard this year, it was decided to make a change and use instead the names of the old vessels (also products of the Newport News yard) which had been purchased by the government during the Spanish war. The supposition is now advanced that if additional vessels are built they will be given the names originally chosen for the steamers lately completed. The new vessels are presumably designed for service between New York and New Orleans.

NO RIVER AND HARBOR BILL.

Chairman T. E. Burton of the river and harbor committee of the house of representatives says that in all probability no river and harbor bill will be presented until early in the session which convenes in December, 1900. According to Mr. Burton there are many reasons for this conclusion, among them the difficuty of framing a bill at the short session and giving it proper consideration in conference after it has passed the senate with amendments. Another reason for delaying the preparation of a general bill is the fact that there is urgent need of hurrying improvements at important points that must be provided for in the sundry civil appropriation bill under the system of continuous contracts, notably the mouth of the Mississippi river, the Delaware river below Philadelphia and the St. Mary's river between Lakes Huron and Superior. Then, too, contractors are busy, the prices of material are high and the army engineers have about all they can attend to for some time to come in making plans and supervising the work authorized under previous measures.

NEW REVENUE CUTTER SEMINOLE.

Capt. Russell Glover, superintendent of construction of the United States revenue cutter service, is highly pleased over the showing made during the trial a few days ago of the cutter Seminole, just completed by the Columbian Iron Works, Batimore, Md. On the official trial over a course of 8.75 knots in Chesapeake bay, the new cutter averaged 16.47 knots per hour. The greatest speed attained was 17.59 knots. No allowance was made for the current and the figures represent the actual speed attained. The Seminole is 188 feet in length over all, 170 feet between perpendiculars, 29 feet beam and 16 feet depth. Her engines are of the vertical, inverted cylinder, direct acting, triple expansion type, with cylinders of 20, 32 and 50 inches diameter and 27 inches stroke. The indicated horse power on trial was 1600. Steam is supplied from boilers 13 feet in diameter by 10 feet long with a working pressure of 160 pounds. The vessel is fitted with a Williamson steam steerer, Hyde windlass and Gibson & Kirk's mechanical telegraph.

VESSEL LOSSES ON THE GREAT LAKES, SEASON OF 1899—LIST INCLUDES ONLY TOTAL LOSSES, VESSELS THAT ACTUALLY PASSED OUT OF EXISTENCE.

Name of Vessel.	Date.	Type.	Cause.	Where.	Capacity, net tons.	Value, approximate.	Owner.
Moran, J. V	Feb. 16.	Steamer.	Foundered.	Off Grand Haven	1,500	$ 50,000	Crosby Trans. Co., Milwaukee.
Nelson	May 13.	Schooner.	Foundered.	Off Grand Marais	1,400	12,000	Mitchell Trans. Co., Bay City.
Ganges	May 16.	Schooner.	Collision.	Mouth Detroit River	650	4,000	W. H. Oades, Detroit.
Erie	May 18.	Tug.	Stranded.	Near Dunkirk	.....	6,000	W H. Hill, Erie, Pa.
Stewart, R. G.	June 4.	Steamer.	Burned.	Apostle Islands	300	7,000	C. O. Flynn, Duluth.
Nelson, O. M	June 5.	Schooner.	Stranded.	On Pilot Island	400	2,000	P.Hanson,Washington Is.,Wis.
Torrent, Nellie	June 22.	Steamer.	Burned.	Head of Lake Huron.	500	12,000	G. W. Jackson, Bay City.
Satisfaction	June 18.	Tug.	Burned.	Off Sheboygan	.....	2,500	John Madden, Sheboygan.
Benson, J. R	June 22.	Schooner.	Foundered.	Off Sandusky	700	3,500	John Mullen, Amherstburg.
Olwill, Margaret	June 28.	Steamer.	Foundered.	Off Lorain	900	10,000	L. P. & J. A. Smith, Cleveland.
Minch, Sophia	July 15.	Schooner.	Stranded.	Near Ashtabula	1,150	8,000	Nicholas Trans Co., Cleveland.
Breden, John	July 21.	Schooner.	Foundered.	Lake Huron	600	500	M. S. Jones, Detroit.
Pilot	July 29.	Tug.	Burned.	Near Menominee	.....	5,000	Spaulding Lumber Co.,Chicago
Ruelle, Grace	July 29.	Tug.	Foundered.	Saginaw Bay	.....	600	A. Ruelle, Jr., Detroit.
Ontario	Aug. 10.	Steamer.	Stranded.	Jackfish, Lake Superior	1,200	12,000	John Cornwell, Sombra, Ont.
Cleveland, H. G	Aug. 13.	Schooner.	Foundered.	Off Cleveland,Lake Erie	600	2,000	Frank Jenkins, Cleveland.
Savidge, Hunter	Aug. 20.	Schooner.	Foundered.	Pt. au Barques,Lak.Hur	350	3,000	Jno. Mullerweiss, Alpena.
Red Cloud	Sept. 3.	Tug.	Foundered.	Cedar Point, Lake Erie.	.....	.....	Great Lakes Towing Co.
Lisgar	Sept. 3.	Schooner.	Foundered.	Lk. Huron, nr.Goderich	600	3,500	Matthews Bros., Toronto.
America	Sept. 8.	Schooner.	Foundered.	Near Chicago	200	500	Barry Bros., Chicago.
Dorr, G. J	Sept. 24.	Tug.	Foundered.	Near South Chicago	.....	5,000	O.B.GreensDredgeCo.,Chicago
Neff, S	Sept. 26.	Steamer.	Burned.	Pelee Island, Lake Erie	300	14,000	John Corrigan, Cleveland.
Emery, W. Y	Sept. 26.	Schooner.	Stranded.	Lake Ontario	400	6,000	.....
Typo	Oct. 14.	Schooner.	Collision.	Lake Huron	780	4,000	H. Henderson, Cleveland.
Badger	Oct. 24.	Schooner.	Stranded.	Lake Huron	150	2,000	J. E. Kirtland, Green Bay.
Grover, Chris	Oct. 25.	Schooner.	Stranded.	Lake Superior	300	2,500	Jacob Werner, Marquette.
Rival	Nov. 3.	Schooner.	Foundered.	Lake Erie	450	2,500	Chas. Herns, Cleveland.
Niagara	Dec. 6.	Steamer.	Foundered.	Lake Erie	600	20,000	J. & T. Matthews, Toronto.
Point Abino	Dec. 11.	Steamer.	Stranded.	Ballast Island, Lk. Erie	325	3,000	Nelson Mills, Port Huron.
Mary	Dec. 9.	Steamer.	Burned.	St. Joseph	.....	18,000	Graham & Morton Co.,Chicago
Morning Star.	Dec. 11.	Schooner.	Stranded.	Lake Michigan	400	1,500	F. X. Ulrich, Milwaukee.
Hawley, R. K	Dec. 12.	Tug.	Foundered.	Lake Erie	.....	5,000	Great Lakes Towing Co.
Whaleback 115*	Dec. 13.	Barge.	Steel barge.	Lake Superior	3,200	80,000	John D. Rockefeller.
					17,955	$307,600	

*Search is still being made for this vessel which parted from her steamer on Lake Superior more than a week ago, but hope is about given up.

AROUND THE GREAT LAKES.

Marine Engineer Beneficial Association, No. 78 of Duluth elected the following officers for the coming year: President, M. Ryan; vice president, W. A. Redher; secretary, L. M. McNamara; treasurer, A. Harvey; delegate to national convention, James H. Bishop; trustees, A. Harvey, James H. Bishop and R. F. Barrows.

W. A. Rogers, who recently added to his Tonawanda fleet the steamer John F. Eddy, has just purchased the steamers Fred Mercury and H. E. Packer for the Iroquois Iron Co. of South Chicago, in which Rogers, Brown & Co. are large stockholders. The Lehigh company sold these boats during the summer to owners of the Union furnace at Buffalo to help out its season's ore charters, who now transfer them to the Iroquois company. The price is not stated, but is understood to be the same paid to the Lehigh company.

Upon complaint from Capt. A. B. Davis of the United States revenue cutter service, who is in charge of the navigation of the Sault river, the treasury department has imposed a fine of $300 on the steamer North Star, due to alleged violation of the river rules, which it is claimed resulted in the grounding of the Rockefeller steamer Siemens and the great blockade of vessels at the Sault a couple of weeks ago. This action of the treasury department will have no effect on the suit at law that will undoubtedly result from the Sault river accident.

Mr. L. M. Bowers of the Bessemer Steamship Co. has been quite ill at his home in Binghamton, N. Y., for some two or three weeks past, but it is understood that he is very much improved within the past few days. No doubt the large and stirring business transactions of the past two months had some effect on the health of Mr. Bowers as well as other men connected with leading ore and vessel interests. It is understood that Mr. L. C. Hanna has been advised to drop business for an indefinite period and that he will leave Cleveland in a few days to be gone all winter.

It is quite probable that members of the Engineers' Beneficial Association on the lakes will make a determined effort to deal with the vessel owners for next season on a basis of season salaries, so as to have the matter of their wages removed from the schedule of the Lake Carriers' Association that deals with all employes aboard the vessels excepting captains. An effort may be made to bring this matter up at the coming annual meeting of the association. If the subject is introduced it is not probable that the general body will attempt to handle it. The proposition would very probably be referred to a special committee or to the executive committee of the association.

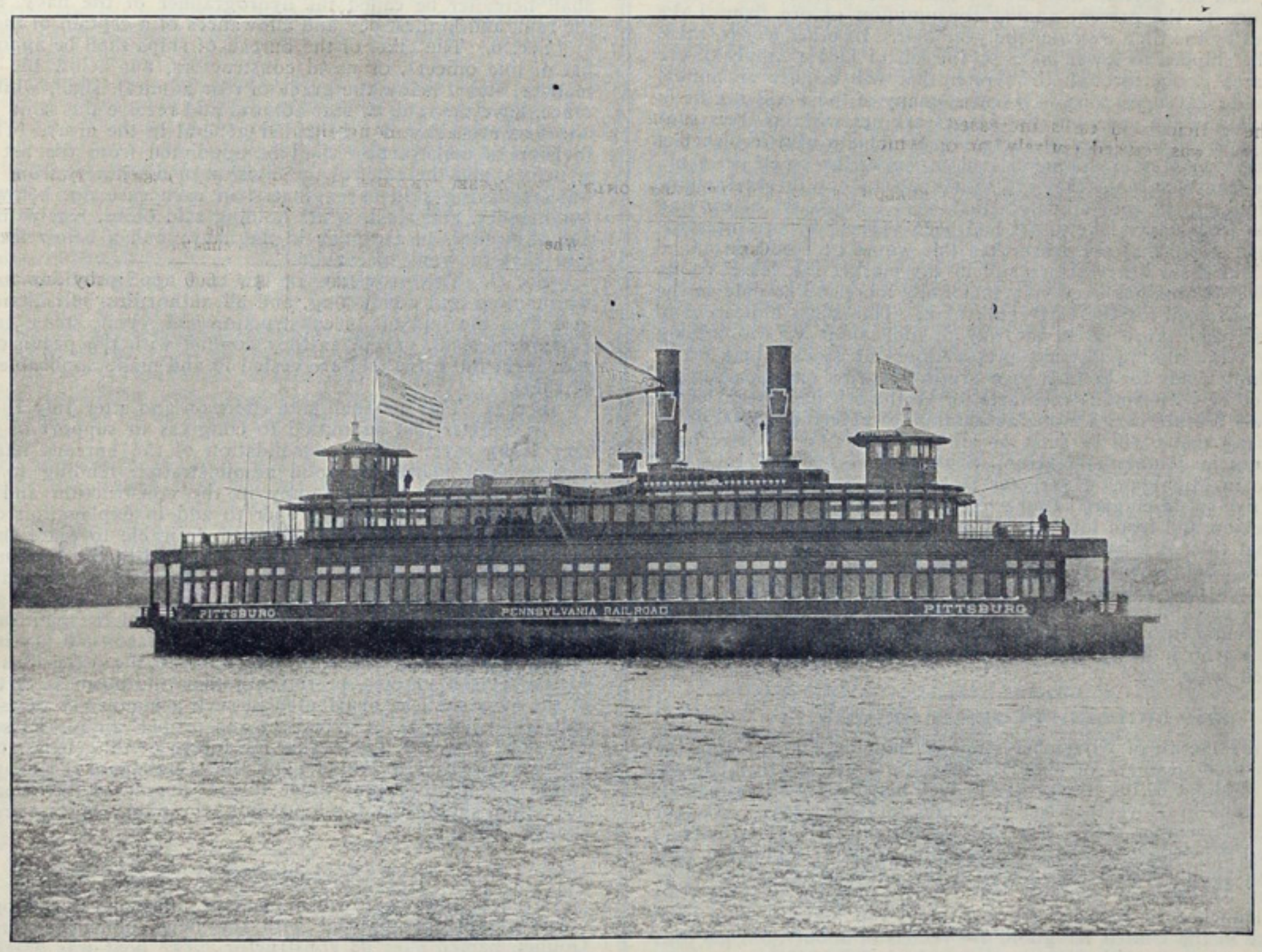
Officers of the Lake Carriers' Association are pleased with the expectation that the treasurer's report to be submitted at the annual meeting in Detroit next month will be the best in years. The association has always carried some little indebtedness, but the report this year may possibly show a very small balance in the treasury. A bill has been introduced in congress to reimburse the association for moneys expended on account of private lights, and a determined effort is to be made to avoid all possible private-light expense next year. It is understood that gas buoys which might possibly be used to replace private lights on the Sault river have lain in Detroit unused during the past season, for the reason that the inspector of the eleventh light-house district was unable to supply them with gas. It will not be possible, of course, to secure a new tender with gas tanks in time for next season, but the vessel owners will try to induce the light-house board to charter a vessel for the delivery of coal, oil, etc., to the light-houses of the lakes, so that the regular tenders may give more time to the charging and care of the lighted buoys. The action of the executive committee of the Lake Carriers in selecting the Cadillac hotel for the annual meeting in Detroit is generally approved, as that house is so large and offers facilities so generally suited to the meeting that the members and others in attendance will not be divided among several hotels. All the meetings, the banquet and everything in connection with the convention will take place at the Cadillac.

A NOVEL STEAM YACHT.

In the steam yacht Dreamer, which has just been completed at the Crescent Ship Yard, Elizabethport, N. J., Mr. Lewis Nixon has produced a very handsome and serviceable vessel. This yacht, built for Thomas W. Lawson, was designed by Clinton H. Crane and is 182 feet in length over all, 150 feet on the water line, 23 feet beam and 11 feet draught. The steel hull is flush plated from the upper turn of the bilge. Steel is also the material used in the deck and house and all exposed woodwork is teak. The yacht is schooner rigged, the hull being black and the funnel cream color.

The dining room is in the forward part of the deckhouse and the galley is below. At the after end is the deck saloon, with a smoking room and chart room further aft. Above the dining room the sun deck is located and a bridge is situated at the forward end. The owner's quarters, which are below deck, consist of two suites, one forward and one aft of the engine space. There are two staterooms and a bath in the forward suite. The rooms are 17 by 10 and 14 by 12 feet, respectively. Two staterooms and a library of 18 by 12 feet make up the after suite. Forward of the owner's suite are five staterooms and bath, while aft are two staterooms and bath. The crew's quarters are forward and the officers' quarters in the after part of the yacht.

The Dreamer is fitted with triple expansion engines, the cylinders of which are 14, 21 and 32 inches in diameter and 20 inches stroke. Steam is supplied from two water tube boilers, and the machinery is expected to drive the vessel at a speed of 12 knots under natural draft or 15 knots under forced draft. The bunker capacity is sufficient to enable the vessel to make a cruise of 5,000 miles. The equipment includes a refrigerating plant, electric lighting plant and steam steering gear. In addition there is an automatic recorder, which registers the time and duration of every blast of the whistle, and a telltale light carried on the bridge, which is connected with the side lights. This telltale is extinguished when either of the side lights goes out.



THE PENNSYLVANIA RAILROAD COMPANY'S NEW FERRYBOAT PITTSBURG—ONE OF THE VESSELS WHICH REPRESENTS THE LATEST PRACTICE IN CRAFT OF THIS CHARACTER.

The Jackson & Sharp Co., Wilmington, Del., has launched the large tug building for the National Dredging Co.

A BRIGHT VIEW OF 1900.

When it was said in these columns a short time ago that the output of iron ore from the Lake Superior region in 1900 would very probably aggregate 20,000,000 gross tons, it was declared on all sides that the estimate was too high. Objection was not raised to the claim that there would be a demand for the ore, but it was said that it could not be mined, and if it were mined it could not be moved with the present railway facilities. But now that preparations are being made by all the leading railways for additional equipment and an output of more than 18,000,000 tons of ore is assured for the year that is not as yet quite at an end, there is no objection to the twenty-million estimate. In fact the Iron Age of New York, claiming to keep fairly well posted on the Lake Superior situation through leading interests of New York and Pittsburg, puts the requirements of next year, if new and old furnaces are to be kept going through 1901, at 22,000,000. The Iron Age editorial on this score is quite interesting. It is as follows:

"Perhaps lake and rail shipments of iron ore in the now closing year will reach the sum of 18,000,000 tons. There was little ore on lake docks last May, and should melting go on during the winter at about the rate of the past few weeks there will be little next spring. It has been stated that furnaces to make close to 5,000,000 tons of metal a year are now under construction, or are planned for an early start. Most of these are for lake ores, and the portion that are for lake ores will add at the rate of 7,000,000 tons to the present annual consumption of ore from Lake Superior mines by the time we enter the year 1901. In other words, there will have to be shipped to lower lakes by the fall of 1900 a supply of ore to keep furnaces going through the winter that will require an annual supply of close to 22,000,000 tons. Of course many of these will not be in operation till late in the year, but the figures are not without their suggestion. Perhaps the total may be increased, for it is a well known fact that while assays on Mesabi shipments seldom run as low as 60 per cent., it is a rare ore from that range that will show that much in furnace results.

"Some time ago it was estimated that vessel capacity for moving 18,000,000 tons from upper lake docks had been secured by ore interests, and it was then stated that not more than this would or could be mined or shipped. But these interests are still in the market for vessel room, and that 18,000,000 tons has been very materially increased to date at the same rate as was paid for the early bulk of it. This is an indication of what these interests figure on in the way of movement for the coming year. All over the mining districts preparations for stock-piling, stripping and making ready for another year are in progress on a scale never before dreamed of. Enormous contracts for earthwork have been let, in the case of two Mesabi mines alone amounting to nearly 3,000,000 cubic yards, and many shafts will be sunk on all ranges at once. There have been two mines in Minnesota reaching a product of 1,000,000 tons this year, and two in Michigan. Next year there may be five in Minnesota and four or five in Michigan. Improvements to railroads, both in the upper lake region and from lower lakes to furnaces, are such as to give confidence that their ore handling capacity can be increased an average of 15 per cent. Betterments to docks and equipments are such as to assure a dispatch that will increase the seasonal capacity of the fleet in about the same percentage. Old mines are ready for a larger output, new mines are wheeling into line, new equipment and facilities will be ready, all to give the iron industry such a supply of raw material as was not dreamed of ten years ago."

SHIP BUILDING IN GREAT BRITAIN.

During the month of November English ship builders put into the water twenty-four steamers of about 76,494 tons gross, against twenty-nine vessels of about 69,194 tons gross in October, twenty-six vessels of about 72,604 tons in November last year, and fourteen vessels of about 34,681 tons in November, 1897. For the eleven months English builders have launched 277 vessels of about 780,148 tons gross, as compared with 311 vessels of about 780,315 tons gross in the corresponding period of last year, and 530,030 tons gross in 1897. Two steamers of 18,835 tons gross were launched at Belfast. During the eleven months there have been launched in the United Kingdom 598 vessels of about 1,323,665 tons gross, which compares with 653 vessels of about 1,293,563 tons for the corresponding period last year, and 601 vessels of 911,569 tons in 1897.

Clyde ship builders during the month of November sent off the stocks 38,830 tons gross of new shipping, as compared with 33,350 tons the month previous, and 31,000 tons for November of last year. The present November output, in fact, has only been twice exceeded in any corresponding period during the past ten years. The aggregate output for the eleven months now past reaches 406,770 tons, which is much the highest figure for any corresponding period in the previous history of the industry. The aggregate for the whole twelve months is almost certain to be the record output, it being only necessary that the output for December should reach 60,000 tons in order to equal last year's grand aggregate, which was 466,800 tons, and the highest figure ever reached. December outputs as a rule exceed those of the other months, and there is every probability that it will on this occasion reach not only 60,000 tons, but 70,000 tons or more, seeing that two vessels, each of over 10,000 tons, and a warship of 12,000 tons, fall to be sent off the stocks before the end of the year. The new work placed with the Clyde builders during November amounts altogether to about 40,000 tons.

A rather interesting trial was that of the new British torpedo boat destroyer Spiteful, which was completed a short time ago by Palmers' Ship Building & Iron Co. at Yarrow-on-Tyne, England. At a speed of 29.9 knots the coal consumption was at the low rate of 2.3 pounds per indicated horse power per hour. On six runs over a measured mile the vessel on each occasion exceeded a speed of 30 knots, and finally on a twelve-hour run at 13.05 knots speed the coal consumption was found to be at the rate of 1.5 pounds per indicated horse power, so that at this rate the vessel has a steaming radius of 4,000 miles. The Spiteful has two sets of triple expansion engines capable of developing 6,300 indicated horse power and to which steam is supplied from four water tube boilers working at 250 pounds pressure.

CONSOLIDATION OF NAVAL BUREAUS.

The full text of the bill now before congress for the consolidation of the navy department bureaus of construction and repair, steam engineering and equipment, is as follows:

Be it enacted, etc., that the bureaus of construction and repair, steam engineering and equipment of the department of the navy, are hereby consolidated and merged into one bureau to be called the bureau of ships.

Sec. 2. The duties and business heretofore performed and transacted by the bureaus of construction and repair, steam engineering and equipment, are hereby transferred to and shall be performed and transacted by the bureau of ships, subject to the provisions of sec. 419 of the revised statutes, relating to the distribution of business of the navy department.

Sec. 3. In the bureau of ships there shall be two divisons, to be called, respectively, "the division of construction" and "the division of machinery."

Sec. 4. The duties and business of the bureau of ships shall be distributed between the two divisions as the chief of the bureau, under the supervision of the secretary of the navy, may direct.

Sec. 5. The hydrographic office is hereby placed under the supervision of the office of the assistant secretary of the navy, or under such bureau as the secretary may direct. The chief of the hydrographic office shall hereafter be called the hydrographer of the navy, and shall have the rank and highest pay and allowances of a captain of the navy.

Sec. 6. The chief of the bureau of ships shall be appointed from the list of line officers, or naval constructors, not below the grade of commander, and if below the grade of rear admiral, shall, while holding said office, have the rank of rear admiral and receive the same pay and allowances as are allowed a brigadier general in the army. The chief of the division of construction shall be appointed from the list of naval constructors, and the chief of the division of machinery from the list of line officers having skill as engineers, in each case not below the grade of commander, and shall, while holding said office, receive the highest pay and allowances of a captain in the navy; and if below the grade of captain have the rank of captain.

Sec. 7. The provisons of law and appropriations for establishing, maintaining and conducting, and all authorities, jurisdiction and powers vested in the bureaus of construction and repair, steam engineering and equipment shall, except as they conflict with the provisions of this act, remain in full force and are vested in and made applicable to the bureau of ships.

Sec. 8. This act shall take effect on and after July 1, 1902.

In a letter just submitted to congress in support of the bill Secretary Long says: "The consolidation of the bureaus named is desired merely as a matter of good administration tending to promote simplicity, efficiency and economy in the construction and equipment of naval vessels. It may be proper to add in explanation of section 5 of the enclosed draft that it is deemed desirable to place the work of the hydrographic office, now by statute assigned to the bureau of equipment, under the immediate administration of the assistant secretary of the navy, who could also be given, without any change of statute, general control over the affairs of the naval observatory and the nautical almanac and compass officers. There seems to be no reason for making, in the case of the hydrographic office, an exception to the provisions of section 419 of the revised statutes, prescribing that 'the business of the department of the navy shall be distributed in such a manner as the secretary of the navy shall judge to be expedient and proper' among its several bureaus. In order, however, to provide for future contingencies, the section has been so drawn as to confer upon the secretary of the navy the power to assign the hydrographic office to any bureau of the department, in his discretion, should the development of the public business render a further change possible."

SUBMARINE BOAT LE GOUBET.

French naval authorities manifest unusual satisfaction with experiments recently completed with the new submarine torpedo boat Le Goubet, named after its constructor. The boat was practically invisible during the tests, for it was only at intervals that the conning tower was allowed to emerge in order to allow the pilot to get his bearings and then dive again. The vessel is controlled entirely by electricity. The great object of the inventor has been to make the vessel as small as possible in order to facilitate convenience in transportation. The Goubet is a cigar-shaped craft and port holes are placed on the upper section. Precautions are taken against the breaking of the glass by the addition of steel caps that can be instantly closed at the moment of danger. The motive power is an electrically-driven screw. Diving and returning to the surface are accomplished by means of fins placed at the side of the boat and the compressed air storage tanks are placed forward. Four men can manage the boat and launch the torpedoes. The French government has requested the inventor, M. Goubet, not to dispose of the invention to any foreign nation until they have decided whether or not to purchase the exclusive right to its use.

Examinations will be held under the direction of the United States civil service commission on Jan. 9, 10 and 11 in cities where the commission has boards of examiners for the position of architectural and structural steel draftsman. From the eligibles resulting from this examination certification will be made to the position of architectural and structural steel draftsman in the bureau of yards and docks, navy department, in the yards and docks department at Boston and at League island, Pa. The first two have compensation fixed at $4 per day and the last mentioned at $4.50 per day.

The Nickel Plate road will sell holiday excursion tickets good going on Dec. 23, 24, 25, 30 and 31, 1899, and Jan. 1, 1900, at one and one-third fare for the round trip; good returning to and including Jan. 2, 1900. With its peerless trio of daily express trains and an unexcelled dining car service, the Nickel Plate road offers special inducements for holiday travel.

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ITEMS OF GENERAL INTEREST.

A very handsome engraved calendar has just been issued by John S. Parsons, the well-known ship chandler and sail maker of Oswego, N. Y.

The navy department has transferred to the war department the auxiliary vessels Viking and Kanawah. The price of the former was $30,000 and the latter $50,000. These vessels will be used in the customs service in Cuba.

The Penn Steel Casting Co. of Chester, Pa., has delivered to the Roach ship yard, Chester, Pa., during the past week four large propeller blades for one of the steamers for Hawaiian-American service now building there.

Mr. Charles J. Dougherty, electrical engineer at the works of the Wm. Cramp & Sons Co., will read a paper before the Engineers' Club of Philadelphia on the evening of Dec. 16 on the subject "The Electrical Process of Annealing Armor Plates in the Construction of War Ships."

In the last weekly report of new vessels issued by the bureau of navigation, treasury department, the steamer El Cid, recently completed by the Newport News Co., is listed at 4,608 gross and 2,921 net tons burden. The steam yacht Dreamer, built at Elizabeth, N. J., is of 288 gross and 196 net tons.

The cruiser Albany, which has been building at the Elswick yard of Sir W. G. Armstrong, Whitworth & Co. at Newcastle-on-Tyne, England, has been completed and her machinery trials have been in progress on the Tyne this week. Lieut. Colwell, who represents the United States navy in England, has been present at the trials.

The Ontario government has issued an order which it is claimed may result in the establishment in that province of extensive works for the production of nickel for use in the construction of war vessels for the British navy. It is designed to enable the British admiralty to secure an interest in the still unpatented nickel lands of the province.

Many vessels engaged in the coal trade on the Atlantic coast are being seriously delayed by the shortage of the coal supply at Baltimore. The schooner Mary T. Quinby was delayed 42 days and the new steel sailing ship Edward Sewall has been there a month and is likely to remain another month before she gets her cargo of 5,000 tons of coal for San Francisco.

The provision of the bill governing the construction of the new Pacific cable, which provides that all the work shall be done under the supervision of the navy department, leaves with that department the responsibility for the placing of a great many contracts, inasmuch as it is estimated that the cost of the proposed cable will be in the neighborhood of $10,000,000.

The cruiser Brooklyn has arrived at Manila, winning easily the long distance race with the cruiser New Orleans, which is four or five days behind her. The newer cruiser does not show up so badly beside her big competitor, however, when it is remembered that the Brooklyn sailed from Fortress Monroe on Oct. 16, whereas the New Orleans did not get away from New York until Oct. 21.

The Queen Anne's Ferry and Equipment Co. of Baltimore, Md., has purchased from Capt. S. M. Denny of Philadelphia, the twin-screw steamer Endeavor. This steamer, which was built at Wilmington, is of steel, 150 feet in length by 35 feet beam and has capacity for 700 passengers and 150 tons of freight. She is being refitted and will replace the new steamer Queen Anne during the winter months.

The Daimler Manufacturing Co. of New York city, has just completed a rather novel launch for the East Coast Florida Hotel Co. The boat has a remarkably light draught considering its size. When loaded it will draw but 30 inches of water. The launch is 85 feet long by 16 feet beam, and will have twin-screws driven by two 25 horse power motors. An electric light plant is operated by a small separate motor.

Maj. Z. T. Wood of the northwest mounted police, who kept a record of the number of boats, scows and rafts that passed down the Yukon river in Alaska during the past season, says that the aggregate was 880. Of this number 411 were scows, thirty-seven canoes and fifteen rafts. The remainder were steamers. Thirteen steamers were plying during the season on the lakes between Bennett, White Horse and Atlin.

What might have proved a very serious conflagration occurred at the Wyandotte yard of the Detroit Ship Building Co., a few days ago. The fire spread from the engine house of the saw mill to the mold loft, a building 240 by 40 feet in size. Both buildings were destroyed, but various patterns, including a model of the new Carnegie steamer, were saved. The loss, which was quite heavy, was fully covered by insurance.

The new White Squadron which Admiral Norman H. Farquhar will shortly command, will in all likelihood constitute the most powerful fleet of war vessels ever assembled in American waters. Among them will be the new battleships Kearsarge, Kentucky and Alabama; the battleships Massachusetts, Indiana and Texas; two monitors and probably several smaller vessels, including the converted yachts Scorpion and Vixen.

Some very handsome models have recently been completed at the Boston navy yard, among them the bow section of a 12,000-ton battleship, a quarter section of the same ship, a quarter section of a 1,200-ton composite gunboat and a 1,000-ton gunboat. These models are the first of the kind to be constructed at the Boston navy yard. They will be shipped to the naval academy at Annapolis to be used in the regular course of studies.

The decree arranging for the international competition for the best life saving device in case of disaster at sea was signed a few days ago by M. Alfred Picard, commissioner general of the Paris exposition, and Ferdinand W. Peck, United States commissioner general. It is understood, of course, that this is the competition for the Anthony Pollock prize to which extended reference has several times been made in the columns of the Review.

Commenting on the program of new ships for the United States navy, the Engineer of London says: "The Americans are evidently shaking off the 'moderate dimension' craze to which a few years ago they were disposed to adhere. It is rumored that the 13,500-ton ships will be more or less after the style of the Russian Peresviet type, a very powerful sort of armored cruiser, equal to a first-class battleship in everything save the power to deal vital blows.

At a recent meeting in Washington of the Michigan delegation to congress it was decided to make a concerted move toward securing an increase of pay for the surfmen at the life saving stations on the great lakes and increasing the number of months they are to be on duty. In the bill which was introduced as a result of the meeting it is proposed to pay the men $70 per month for 10 months instead of $60 per month for eight months, which they now receive.

By a deal closed a few days ago James J. Hill, president of the Great Northern railroad, acquired a majority interest in the stock of the St. Paul & Duluth railroad, an independent line connecting Duluth and Minneapolis and St. Paul. The Chicago, Milwaukee & St. Paul road has had traffic arrangements with the Duluth road and it is predicted that this line will now build a road to Duluth. This will make a total of four roads between the points mentioned.

The steamer El Cid, fourth of the Morgan liners constructed during the past year at the yard of the Newport News Ship Building & Dry Dock Co., was given a trial the other day and proved fully as speedy as any of her sister vessels. Work on the new dry dock at the Newport News yard is progressing most auspiciously. The second of the cableways installed by the Lidgerwood Manufacturing Co. of New York city, for the removal of material, is almost ready for use.

Comptroller Coler of the city of New York, in an address delivered in the metropolis recently, declared that the city ought to own the entire system of docks; that it ought to match the docks of Liverpool; that it ought to spend $200,000,000 in building docks, and that the revenue received from the docks would pay all the interest, provide a sinking fund and return a handsome sum in addition to the city treasury, and that this $200,000,000 should not be included in the debt limitation.

The war department last week cancelled the charters of the troopships Elder, City of Para, Belgian King, Tacoma, Zealandia, and Glenagle. These vessels were used in the transportation of troops to the Philippines and have returned to San Francisco. Other ships which will be discharged as soon as they return from Manila are the City of Pekin, City of Pueblo, City of Rio, City of Sydney, Dalny Vostock, Duke of Fife and Manauense. It is the intention of the government to reduce the transport fleet as speedily as possible to those vessels owned outright by the war department.

According to the report of her captain, the use of oil probably saved the Hamburg-American steamer Canadia, which recently arrived at Hoboken after occupying full twenty days in a very rough passage between Hamburg and Sandy Hook. Capt. Schmidt says that the head wind was such that a dozen times or more the vessel had to stop absolutely and head up to wind and wave. In such instances it was found necessary to use oil to prevent the sides of the steamer from being crushed in. At one time there were four oil bags hung over the Canadia's weather side. There was one at each bow and stern and two amidships. The oil which dripped from the bags served to smooth the sea for several hundred yards.

Two transatlantic liners were launched in European yards last Saturday. At the Clydebank company's works the Saxonia, a new Cunard liner of immense size, designed for service between Liverpool and Boston, went into the water, and at Hamburg the new twin-screw steamer Potsdam, built for the Holland-America line, was successfully launched. The latter vessel is the third of the fine new steamers which the Holland-America company contracted for some time ago and is 565 feet in length by 62 feet beam and 44 feet depth. She is fitted with bilge keels and her engines are designed to give her a speed of 15 knots. In addition to large cargo capacity, this vessel has accommodations for 250 first and 150 second-cabin passengers.

Considerable difficulty was experienced in raising the Aryat, the last of the Spanish gunboats to be recovered from the Pasig river in the Philippines. The wrecking operations were in charge of Commander E. K. Moore of the gunboat Helena. When the Aryat was finally raised it was discovered that she was leaking badly, her decks being honeycombed by holes made by torpedoes. Before this could be remedied the chains by which the Helena was raising her broke. A second attempt was successful and the reconstructed vessel is now ready to go into service. Another recent addition to the American navy is an insurgent steamer recently captured by the Oregon near Panay. This vessel will be fitted up as a ferry to run between Manila and Cavite and this will release the Leyte which will thus be enabled to return to her former use as a gunboat on the coast patrol.

Recent tests of Holland submarine torpedo boats have brought about a really surprising change of tone in regard to submarine navigation on the part of the British technical press. This is all the more noticeable in view of the extreme pessimistic attitude which these journals have heretofore assumed in all reference to this subject. The Marine Engineer of London, commenting on the trials of the Holland, says: "It would t' us appear that the American engineers have succeeded, after great patience and perseverance, in perfecting a submarine torpedo boat which has so long been amongst the possibilities. It is of course reported that the French also have a submarine boat which is said to be a practical success and of which some are now being built. Sorry as we may all be to see marine warfare carried out by such stealthy and submerged weapons of offence and defence, we must not shut our eyes to the fact that such submarine engines of destruction appear now within the bounds of practical politics and we must not be behind our friends and enemies in experimenting upon the possibilities of even such noxious insects as submarine torpedo boats." In this connection it may be noted that Senator Stewart of Nevada, a few days ago, introduced in congress a bill authorizing the navy department to purchase the submarine torpedo boat Holland.

MARINE REVIEW

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In an address delivered at the annual dinner of the Rochester chamber of commerce, Rear Admiral William T. Sampson talked at length upon the subject of armor. He said that the fact that we do not at present get the best armor plate is due to congress. "The question now is," said the rear admiral, "shall we take the armor that congress has fixed the price of, or shall we have a higher priced armor? I know what your answer must be. You think we should pay more money and get a better article. Congress has fixed a certain price for armor. It seems to me that congress should withdraw from this position and leave the question open, so that instead of two great armor plate makers there will be many to compete. This will remove the possibility of a trust, such as existed before, when there were only two or three makers."

One of the students at the Massachusetts institute of technology who was on the battleship Kentucky during her recent trial run, gives a very interesting description of the scenes below deck. He says that ten barrels of lard oil were used for lubricating purposes alone and that to get at the small bearings there was utilized a syringe about six times as large as a bicycle pump. The engineers, who were entrusted with the work of taking data, dressed in oil skins throughout. Every lump of coal used was also sorted by hand, washed and polished. During the test the firemen and engineers drank iced imported ginger ale. Three barrels of this were furnished by the company, and inasmuch as the beverage cost 11 cents per bottle, it will be seen that the bill for this item alone amounted to a considerable sum.

Inasmuch as American manufacturers of ship building machinery are making some extensive sales to Italian yards it may be of interest to note that the plant established some two years ago by Hofer, Maneria & Co. at Spezzia has been transferred to a stock company known as the Cantieri Navali di Muggiano with a capital of $600,000. The firm has just turned out a steel vessel 340 feet in length, the horse power engines for which (1,500 horse power) were supplied from England. Some idea of the state of the company's business may be imagined from the fact that they now have on their books orders for sixteen vessels of from 4,000 to 7,500 tons deadweight. The company has six berths for building vessels up to 530 feet in length. About 1,400 men are employed.

The French legislature is considering a measure to modify the shipping bounty law of 1893 by the creation of an outfit bounty as an alternative to the navigational premium and the bringing of the bounty for steamers into line with that for sailing vessels. The increased bounty is to be allowed only on ships constructed of iron or steel. The conditions are that the ships shall be of French build and that when they are fifteen years of age they shall cease to draw the premium. The outfit bounty will be paid for twenty years from the launching of the steamer. The owner is at liberty to choose whichever bounty he anticipates will prove most beneficial to him. The bill, it is said, is certain to be passed.

Capt. J. G. Warren, engineer of the ninth light-house district, has given notice that vacancies exist in the list of eligibles for the position of superintendent of the light-house service in that district. One position will require a machinist who understands the construction and repair of machinery and boilers. The other positions will require a general knowledge of building construction, qualities of material, and ability to handle working force. Persons wishing to apply for the position may obtain blank forms of application from Capt. J. G. Warren, whose office is at the custom house, Milwaukee, Wis.

Officials of the Lake Carriers' Association do not seem very much concerned over the latest Detroit river bridge bill, introduced in congress a few days ago by Representative Corliss of Michigan. It is not probable that a special effort will be made to pass this bill or any other bridge measure in the present congress, but any move on the part of the railway companies interested in bridge legislation will, of course, be watched by Senator Hanna, Representative Burton and other members of congress who will be on the side of the vessel men.

The United States revenue cutter Manning, which rendered excellent service during the Spanish-American war and which is now at the Erie basin, Brooklyn, N. Y., has been ordered to proceed to the Pacific via the Straits of Magellan. Upon arrival in the Pacific the Manning will replace the revenue cutter Corwin, which will be put out of commission. The cutter Rush, now at San Francisco, will, it is expected, be sent to Honolulu, and the Grant has been assigned to permanent duty on Puget Sound.

Edward Gillen of Racine, Wis., is the lowest bidder for the construction of 700 linear feet of crib breakwater at Sheboygan harbor, Wis., for which Capt. J. G. Warren, United States engineer, recently opened bids. Mr. Gillen's bid was $83,720 for white pine and $82,800 for Norway pine. The only other bidder, Christie, Lowe & Heyworth of Chicago, submitted a bid of $94,432.48.

THE TRAFFIC OF THE SUEZ.

The assertion made by Senator Hanna in a speech delivered during the late political campaign in Ohio that only four vessels flying the American flag passed through the Suez canal in 1898, has been questioned several times of late by persons not conversant with the facts. The best evidence of the truth of the statement is a table just transmitted by the French vice-consul at Suez. The commerce of the canal during the year 1898 was as follows:

Flags.	No. of vessels.	Total. gross tonnage.
British	2,295	8,691,092
German	356	1,353,161
French	221	891,641
Dutch	193	526,478
Austro Hungarian	85	300,251
Japanese	46	261,601
Russian	48	243,381
Spanish	49	232,358
Italian	74	208,418
Norwegian	47	109,708
Turkish	54	83,540
Danish	8	30,228
Egyptian	10	15,705
Chinese	4	6,180
American	4	3,161
Greek	2	1,941
Roumanian	1	1,703
Swedish	2	1,020
Portuguese	3	605
Argentine	1	450
Total	3.503	12,962,622

It is thus seen that 65.5 per cent. of the total number of vessels, and over 67 per cent. of the tonnage, was under the British flag, while the German flag covered a little over 10 per cent. of both ships and tonnage. French vessels represented over 6.5 per cent., and Dutch vessels over 5 per cent. of the total number of ships, and the former over 6 per cent., and the latter over 4 per cent of the tonnage. The remaining 13 per cent. of both the number of ships and the total tonnage was divided among sixteen different nationalities.

TRADE POSSIBILITIES ON THE PACIFIC.

John D. Spreckels of San Francisco, well-known ship owner, is an enthusiast on the subject of trade possibilities on the Pacific. In a recent conversation he said: "On our Australian line we have refused 30,000 tons of outward bound freight this year for lack of room. The Cramps of Philadelphia are building three 6,000-ton vessels, the Sierra, Sonoma and Ventura, especially for this trade. Our new vessels will be supplied with refrigerators especially fitted for the meat trade.

The need of more ships on the Pacific coast has reached an acute stage. As a result of the shortage of vessels, Tacoma elevators alone contain ten cargoes of wheat with only two vessels in sight to move it during the next two months. The lumber situation is even worse. The manager of one of the largest mills on Puget sound said a few days ago that he could book orders for fifty million feet of fir if ships could be obtained to carry it.

M. Lockroy, former minister of marine in France, has introduced a bill in the chamber of deputies authorizing an appropriation of $100,000,000 for the purpose of placing France on a secure footing against foreign naval aggression. A liberal share of the new appropriation will go, according to the plan, for new coaling stations.

The United States training vessel Chesapeake will have a 48-hour official trial at sea under canvas this week. The trial and inspection board of the navy will give the vessel a thorough test.

Another handsome sale of Pocahontas coal is just reported The British steamer Avala sailed from Norfolk, Va., a few days ago with a cargo of 5,000 tons of this coal for the use of the American fleet in the archipelago.

Harry Rasmussen, proprietor of a boat building works at Essington, Pa., will enlarge the plant. He has on hand at present orders for three launches, including one 60 feet in length for Cook Brothers of Philadelphia.

H. M. Bean, Camden, Me., a few days ago launched the wooden schooner Jennie French Potter. The vessel, which is owned by New York parties, is 279 feet over all, 240 feet keel, 44 feet beam and 21 feet depth.

James Corrigan of Cleveland has purchased from McArthur Bros. of Detroit the wooden schooner J. I. Case, a vessel of about 1450 tons coal capacity. The consideration was probably about $12,500.

The Caledon Ship Building & Engineering Co., whose yards are on the Clyde, have secured from Canadians a contract for a steel steamer 225 feet in length for use on the great lakes.

Arthur Sewall & Co. of Bath, Me., will build a large steel shipentine in the spring, provided the price of steel falls as predicted.

The Nickel Plate road offers to students desiring to return home for the holidays the special rate of one and one-third fare for the round trip. Tickets will be sold on the day school closes and the day immediately preceding, good returning to and including the date school reconvenes, but not later than Jan. 10, 1900. 182, Jan. 1.

SHIP YARD NEWS.

ACTIVITY IN ALL YARDS AT ITS HEIGHT AS THE YEAR CLOSES.

Attention in ship building circles has been especially directed of late to progress made by the Merrill-Stevens Engineering Co. of Jacksonville, Fla. This firm is just completing in the handsome steamer H. B. Plant the fiftieth vessel which has been turned out from its yard. A force of more than one hundred men is now employed regularly, and contracts have recently been placed for an equipment of pneumatic tools and new machinery. There is also being constructed a new marine railway which is double the capacity of the former marine railway. It will be operated by electricity instead of steam. The Merrill-Stevens company has a heavy run of repair work, among contracts recently completed being one for the remodeling of Pierre Lorrilard's famous houseboat, the Caiman.

Officials of the Union Dry Dock Co., Buffalo, N. Y., report the outlook as promising for an exceedingly busy season. Among work in hand, in addition to a large volume of repairs, is the steel steamer (duplicate of the Buffalo) for which a contract was recently closed with the Lehigh Transportation Co., a fire boat for the city of Buffalo and four drill boats for the contracting firm of Dunbar & Sullivan of Buffalo. The force of workmen will shortly be increased to 700, which will represent the size of the force during the winter. The drill boats will be entirely of steel, 50 feet long, 16 feet beam and 5 feet depth.

The Wm. Cramp & Sons Co. has just taken another step in the equipment of its yard on a more extended scale, as noted from time to time in the Review, by placing contracts for a considerable quantity of pneumatic tools. Compressed air has been used on quite a large scale at the Cramp works for some time past, but contracts have now been placed with the Rand Drill Co. for an air compressor of 5,000 cubic feet capacity, and with the Chicago Pneumatic Tool Co. for thirty shell riveters, 120 chip and riveting hammers, ten deck riveters, seventy-five drills and a number of special tools.

A report which appears to be well founded is to the effect that Flint, Eddy & Co. of 30 Broad street, New York city, will build a fleet of five steamers for service in the Brazilian trade. According to the report, each vessel will be of about 4,000 tons register and have a carrying capacity of 6,000 tons dead weight. The speed of the vessels will be 12 knots. Although designed primarily as freight carriers, there will be limited cabin and steerage accommodations, and the time limit for the completion of the five boats is placed not later than Jan. 1, 1901.

Another Oriental steamship line is projected by American manufacturing and commission houses engaged in the East Indian, Chinese and Japanese trade, who are dissatisfied with the freight rates at present charged. It is proposed to subscribe $1,500,000 for an enterprise similar to the China Mutual Steamship Co., which was the outgrowth of similar conditions in London some years ago. Four steamers of about 8,000 tons each will be constructed, it is said, in American yards.

The steam yacht Virginia passed successfully through her speed trial Thursday, Dec. 14. She proved an ideal sea boat, comfortable, staunch and fast. Under natural draft she is a good 12-knot boat, but with forced draft she can steam at a 14-knot gait. The Virginia was built by the Bath Iron Works, and is a very handsome, well-appointed vessel. She will leave New York early in January with her owner, Isaac Stern, on board, for the Mediterranean.

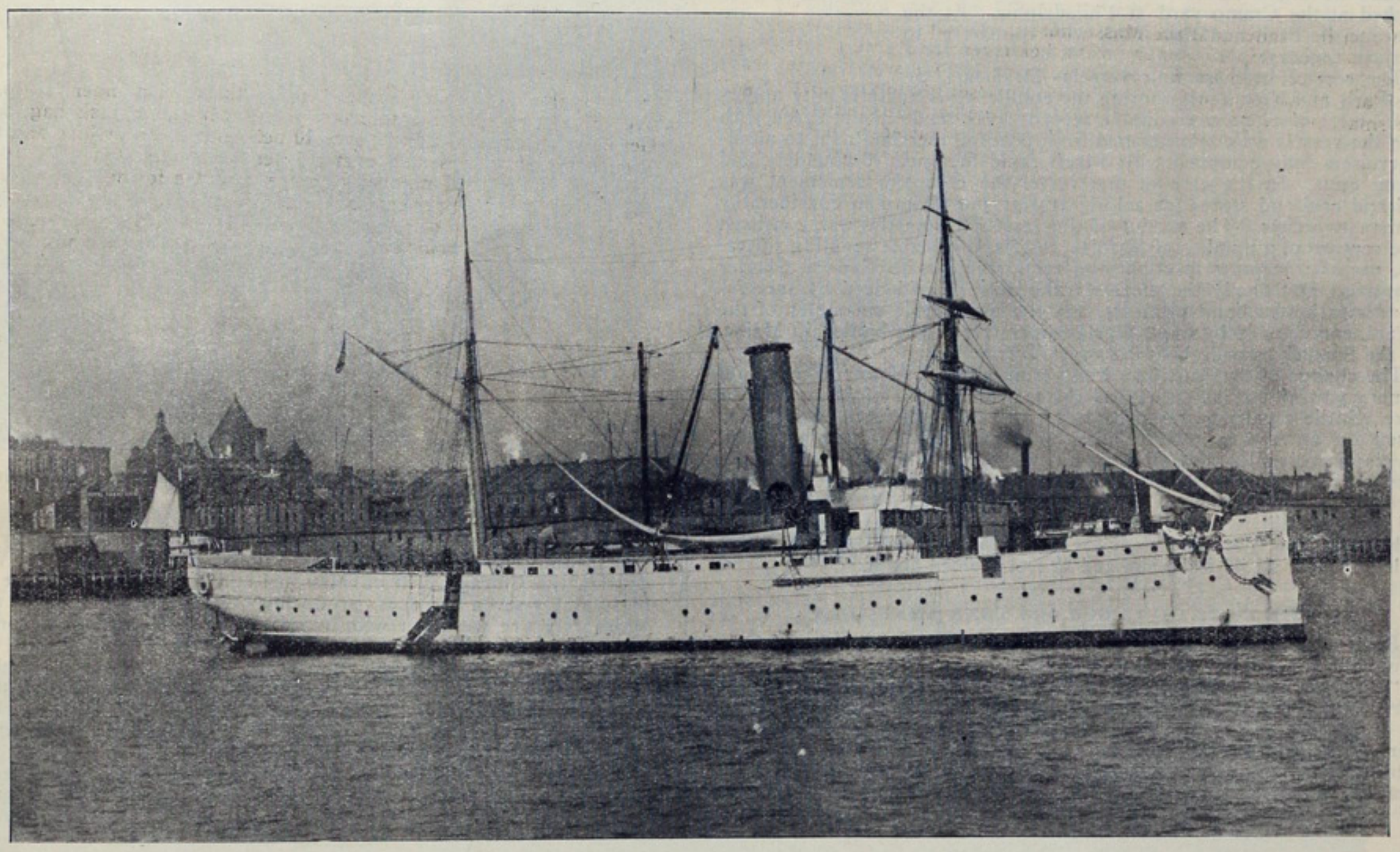
Business is in a very satisfactory condition at the yard of the New Jersey Dry Dock & Transportation Co. at Elizabethport, N. J., according to reports just received from the office of that concern. Within a few weeks there have been launched three large harbor barges, building for the Pennsylvania railroad company. Among recent repair work was that on the Holland submarine boat, which went into dry dock previous to starting for Washington.

Lewis Nixon, proprietor of the Crescent Ship Yard, Elizabethport, N. J., is understood to be endeavoring to purchase more water front property, in order to enlarge his plant. It is said that there is enough work on hand to keep the yard in operation for fully three years, and that if more land cannot be secured at once it will be necessary to carry on operations night and day.

Charles Ryan of Oshkosh, Wis., is building two steamers for the engineer corps, war department. One is the Fox, a side-wheeler 112 feet over all, built especially for service in shallow water, and the other is the Wolf, 85 feet long, also a side-wheeler and built upon very much the same lines as the Fox.

The Merchants Towing Co. has been organized at Portland, Me., for the purpose of operating towboats, barges and other craft. The capital stock is fixed at $300,000 and the officers are: President, S. W. Kilbut of Providence, R. I.; treasurer, A. P. Weeden of Providence, R. I.

Work on the three-masted schooner building at Brooks' ship yard, East Boston, Mass., for R. R. Freeman and others of Boston is progressing rapidly. The vessel, which will be named Future, is 185 feet over all, 156 feet keel, and will have a carrying capacity of 1,100 tons of coal.



THE UNITED STATES REVENUE CUTTER MANNING—CREDITABLE SERVICE DURING THE SPANISH WAR HAS RESULTED IN HER ASSIGNMENT TO IMPORTANT DUTIES.

Longfellow & Harper, who are acting as representatives of McKay & Dix of New York City in the operation of a ship yard at Machias, Me., have received word from the latter firm that they have decided to build two vessels instead of one at the Maine yard next year.

Kelley, Spear & Co. of Bath, Me., have received a contract to build two spruce barges for the Staples Coal Co. of Taunton, Mass. The barges will be 160 feet long, 34 feet beam, 10 feet deep and of 850 tons carrying capacity. They will be completed in March, 1900.

Carter & Co. of Belfast, Me., said to be the oldest ship building concern in the United States, has transferred a one-fourth interest in its yard to Capt. Fields Pendleton, a ship owner of Islesboro, Me. Work will soon be started on another vessel at this yard.

Ship building yards at Essex, Mass., are crowded with work. A. D. Story has four vessels on the ways; John Bishop has a schooner well advanced toward completion and James & Tarr have a good-sized force of workmen busy on three wooden craft.

The name Richard Croker has been given to the new steel tug which the Gas Engine & Power Co. and Seabury & Co., Consolidated, of Morris Heights, New York City, are building for the department of docks and ferries of the city of New York.

President M. E. Ingalls of the Chesapeake & Ohio Railroad Co. is authority for the announcement that the railroad will within a short time place a contract for a new steamer, a small vessel, to ply between Newport News and Norfolk, Va.

AMERICA'S AUXILIARY CRUISERS.

THE WORK OF AMERICAN LINE STEAMERS IN THE SPANISH WAR AND THE POSSIBILITIES OF SIMILAR SERVICE IN THE FUTURE.

The charter by the British admiralty of such large ocean going steamers as the Majestic for war service in connection with South African operations, together with the fact that there are now building in this country a number of vessels that will be admirably adapted to auxiliary naval service, lends special interest to an artistic volume recently issued by the International Navigation Co., descriptive of the war service rendered in 1898 by the steamers New York, Paris, St. Louis and St. Paul of the American line.

The International Navigation Co., whose service has compared so favorably with any rendered to the British government by any of the lines operating under her flag, was organized in 1871, and in 1873 inaugurated a fortnightly service between Philadelphia and Antwerp. In 1884 the American-built steamers Pennsylvania, Ohio, Indiana and Illinois, which proved so serviceable in the Spanish-American war, were acquired. In 1886 the International company purchased the Inman line. In 1894 and 1895 the American-built steamers St. Louis and St. Paul, up to that time the largest vessels ever built in America, were launched at the Cramp yard at Philadelphia. At the same time the Paris and New York were transferred to American registry.

The service of these four vessels—St. Louis, St. Paul, Paris and New York—during the conflict with Spain is fully understood. First of all most creditable records were made in the speed with which the vessels were transformed from peaceful merchantmen to auxiliary cruisers fully equipped with 5-inch rapid fire guns, 6-pounders and Gatling guns. In the case of one vessel the complete armament was fitted and coal and stores for a long voyage put aboard in considerably less than two days. The service of the vessels during the war consisted of the capture of a number of Spanish vessels, invaluable scouting operations, use as transports in conveying reinforcements to General Shafter at Santiago, and finally the more warlike duty as evidenced by successful participation in bombardments, and the memorable encounter of the St. Paul, commanded by Capt. Sigsbee, formerly of the battleship Maine, with the Spanish torpedo boat destroyer Terror.

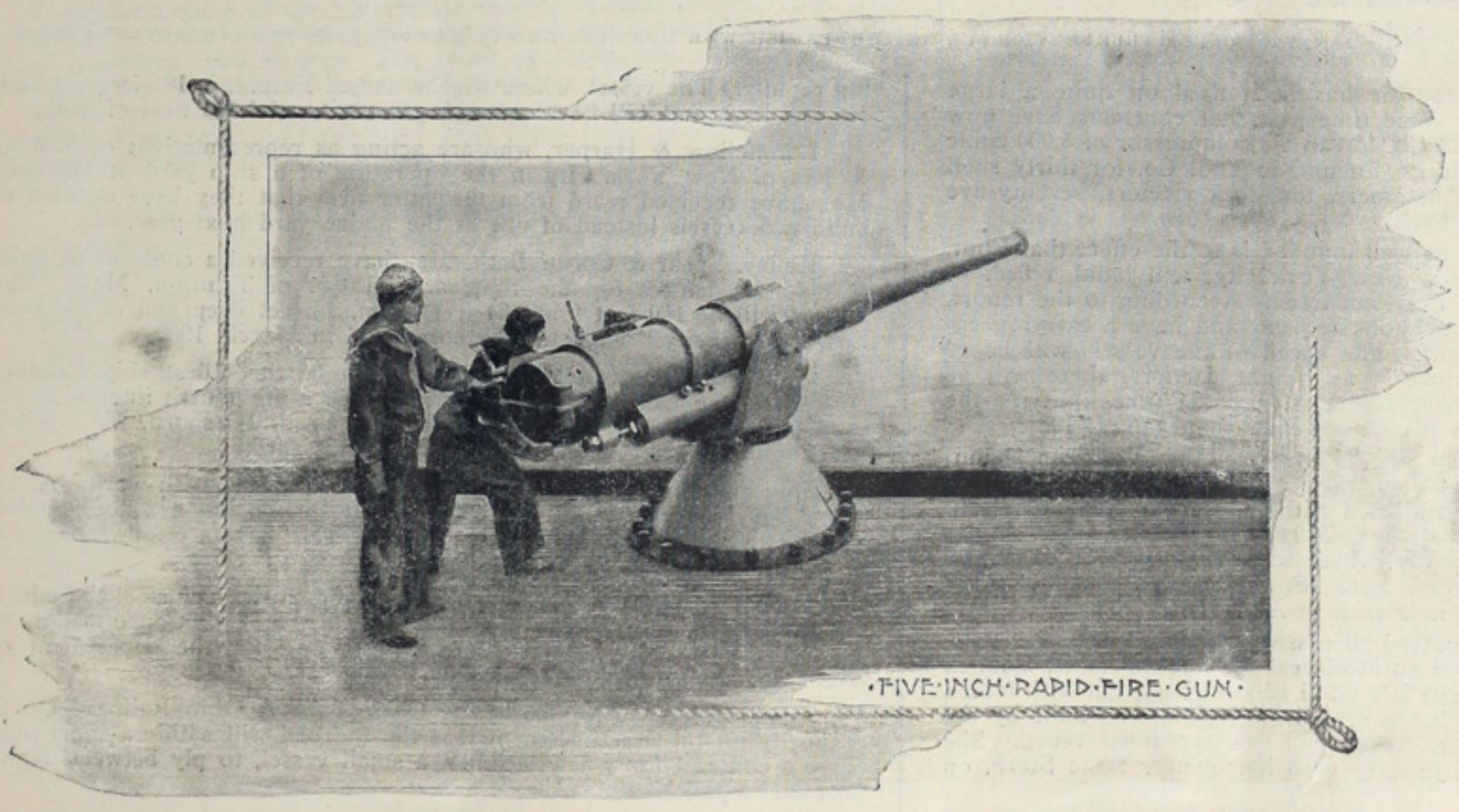
The change of the American liners from cruisers of war to merchant steamers was almost as speedy as the transformation of some months before. Little repairing was necessary, for although each vessel had cruised on an average 15,000 miles and had passed through several showers of projectiles they all came out unscathed. In view of the comparisons likely to be made between these vessels and some of those engaged in the British service, it may be noted that the St. Louis and St. Paul are each 554 feet over all, 535 feet keel, 63 feet beam and 42 feet depth. The New York and Paris are each 525 feet on the water line, 560 feet length over all, 63 feet beam and 42 feet molded depth.

AMERICAN LINER ST. PAUL CARRYING REINFORCEMENTS TO GEN. SHAFTER.

AT THE RATE OF 15,000,000 TONS ANNUALLY.

Reviewing reports as to the enormous production of pig iron throughout the country, the Iron Age says:

"Our monthly blast furnace statistics for December show that we entered the month with coke and anthracite furnaces producing at the rate of 289,500 tons weekly, an increase of 8,000 tons over Nov. 1. In other words, we are making now at the rate of 15,000,000 gross tons of pig iron per annum. During the month reported furnace stocks increased about 5,000 tons, but on the other hand stocks in warrant yards declined 6,000 tons. On Dec. 1 the independent furnaces were carrying a stock of 95,000 tons, or a little over three days' consumption, at its present rate. Under what pressure the iron industry is working is shown by the fact that in the Central West, including Pittsburg, the Valleys, the Wheeling district, the Chicago district, Missouri and the northwest, there were in blast ninety-seven furnaces, producing weekly 170,346 tons of pig iron, while only five were out with a capacity of 5,465, and every one of the latter is simply out for repairs. In the next three months three new furnaces are expected to begin operations, whose capacity should reach 12,000 tons weekly. Practically every ton of the iron which all these furnaces can make during the first half of 1900 is sold. Last week a leading consumer in the Pittsburg district purchased about 40,000 tons of Bessemer pig at $24, valley furnaces, which closed out the last available for the first half of 1900. It is understood that the same interest and other large companies in the same section have been taking large blocks of Basic pig also."



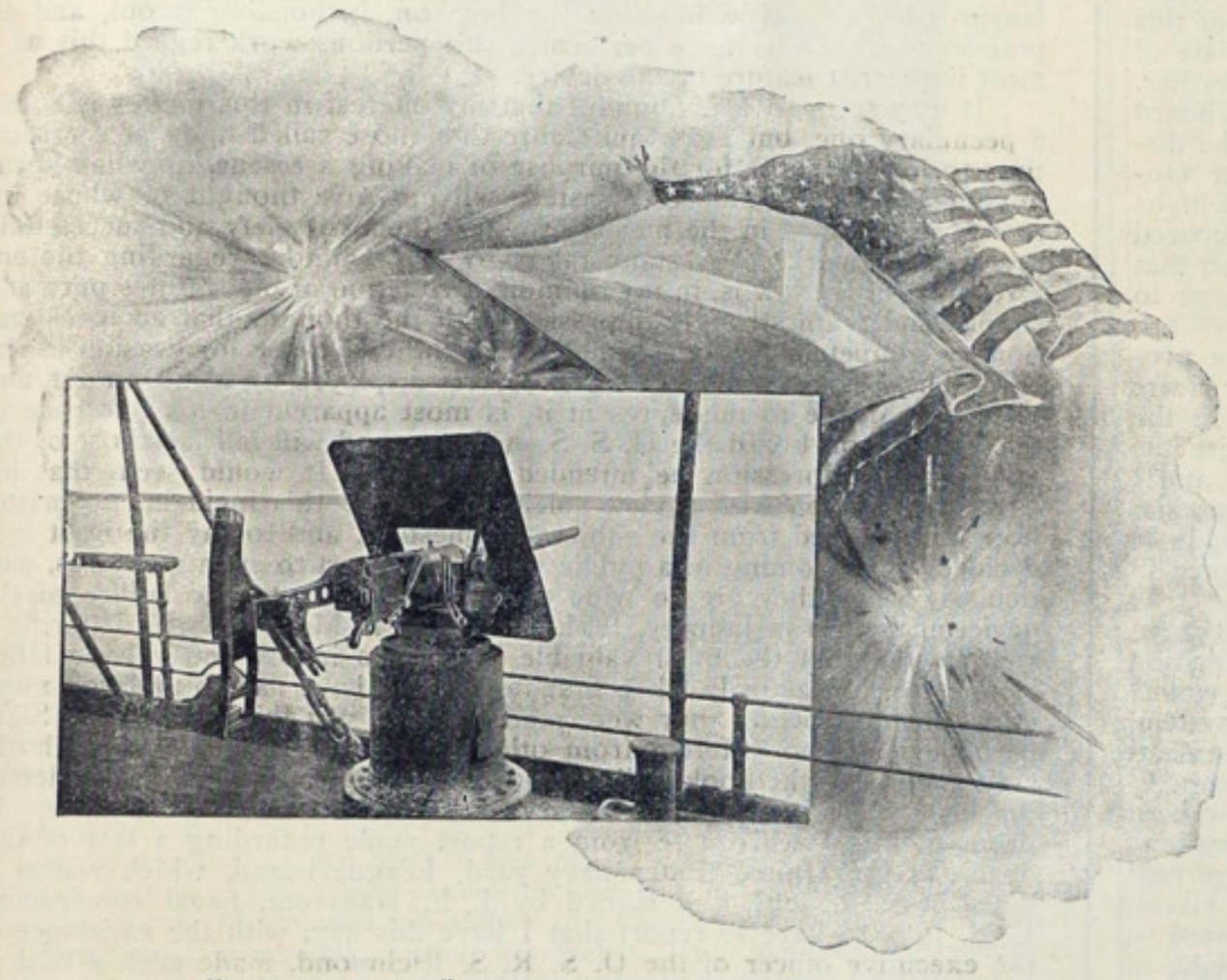
·FIVE·INCH·RAPID·FIRE·GUN·

The Japanese ship yards, which number seventy-three, have constructed in steel or iron only two steamships of over 6,000 tons, two steamships of between 1,000 and 2,000 tons, and thirty-two other smaller steel or iron steam vessels. In the dock yards thirteen vessels of cruiser or gunboat type, totalling 21,600 tons, have been launched since 1885, the largest being the cruiser Hashidate of 4,277 tons. Only the following yards are of any great importance: The Ishikawajima Ship Building Co., at Tokio and Uraga; the Uraga Ship Building Co., at Uraga; the Yokohama Dock Co., the Kawasaki Ship Building Co., at Kobe; the Osaka Iron Works at Osaka, and the Mitsu Bishi Ship Building Co., at Nagasaki. These seven yards, together with the government dock yards at Yokosuka, at Kure and at Sasebo, represent the resources of Japan for the building of first-class steel steam vessels.

GREAT DAM AT NIAGARA.

THE SUBJECT IS BEFORE CONGRESS—A BILL PROVIDING FOR AN APPROPRIATION HAS BEEN INTRODUCED, BUT INTERNATIONAL QUESTIONS ARE INVOLVED AND IMMEDIATE ACTION IS NOT EXPECTED.

Congressman John B. Corliss of Michigan has succeeded in again creating interest in the scheme for regulating lake levels by the construction of an immense dam in Niagara river. It will be remembered that this subject was very fully discussed in a paper recently prepared by Engineer Geo. Y. Wisner of Detroit, which was read before the Cleveland chamber of commerce and printed in these columns. Mr. Wisner, who



"HANDSOME DAN" ON THE AMERICAN LINER PARIS (YALE).

has given attention to the subject for years, is a member of the United States Board of Engineers on Deep Waterways, and his connection with this board has had much to do with bringing the subject forward at this time. Congressman Corliss succeeded, through the war department, in having the deep waterways board make a special report on this score, and now he has introduced in congress a bill providing for an appropriation of $800,000 with which to begin the construction of the dam and providing also for co-operation with Canada in the matter. As the project involves international questions and is in itself a very important undertaking, it is not probable that definite action of any kind will be taken by the present congress, but the discussion is very interesting. The preliminary report of the engineer commission which was probably prepared mainly by Mr. Wisner, consists of forty pages of typewritten matter, but the subject is covered in a brief way in a letter accompanying the report, which is addressed to the secretary of war and which is as follows:

"Under the influence of varying relative supply, evaporation and discharge, the monthly mean level of Lake Erie has had an extreme variation of 4.6 feet during the past 70 years. The low level generally occurs at a time of year when navigation is most active. If the level of the lake could be constantly maintained at or near a high stage, navigation would be greatly benefited by securing a maximum depth at the time when it is most needed, and by the practical deepening of the lake harbors. To maintain the level of a lake at or near some fixed stage, the discharge must be controlled so that it will always be approximately equal to the difference between the supply of water to the lake and the evaporation from its surface. In the case of Lake Erie this can only be accomplished by establishing regulating works in or near the discharging waterway. These works must be so arranged that they will not only maintain the level of the lake at or near the fixed stage adopted, but also so that they will produce no injurious effects upon the lakes and waterways from which a part of the supply is derived, or upon those which receive the discharge.

"This is the problem which the board has investigated. For the details of its investigation, the methods employed, the data and reasoning upon which they are based, and the results obtained, the board refers to the paper on lake regulation by Mr. George Y. Wisner, member of the board, which is appended to this report. This paper was prepared by Mr. Wisner in consultation with the other members of the board, and it fully expresses their views. In this report, therefore, it is only necessary to give a brief statement of the conclusions at which the board has arrived. The board is of the opinion that the best location for works for regulating the level of Lake Erie is at the foot of the lake just below Buffalo harbor. The location in the Niagara river below Tonawanda has been advocated, but the board finds upon investigation that regulation by works at this point would be less effective and much more expensive than at the adopted location. The works projected by the board are designed to distribute the discharge of the lake so as to reduce its variation of level to a small amount. This result cannot be attained by the use of submerged fixed weirs only, and a series of sluices is added to secure, in combination with fixed weirs, the control desired. The weirs will be constructed of concrete blocks and will have an aggregate length of 2,900 feet. The sluices, thirteen in number, of the Stoney type, will each have an opening of 80 feet, making an aggregate of 1,040 feet. The piers separating the sluice openings will be of substantial first-class masonry. These sluices can be operated under rules easily formulated and, in the opinion of the board, amply provide for conditions more unfavorable than any recorded. A canal with a lock is provided on the American side around the end of the dam and the rapids at the head of the river, affording a much safer navigable channel than the present one through the rapids. The estimated cost is: For regulating works $796,923; for lock and canal, $2,325,967. This would be quite necessary to accommodate traffic below Buffalo along the Niagara river.

"The extreme high water stage of Lake Erie is about 575 feet above tide water. The level adopted by the board for regulation is 574.5 feet, or about 0.5 foot below the level of extreme high water. This is the lowest elevation at which regulation can be effected without enlarging

AMERICAN LINER NEW YORK (HARVARD) RESCUING THE CREWS OF THE DESTROYED SPANISH FLEET.

the cross-section of the river at the gorge. Should it, for any reason, be considered desirable to regulate the lake at a lower level, the desired result can be accomplished by enlarging the cross-section of the river so as to provide for the maximum discharge at the adopted level. The board is of the opinion that, with the works proposed, the level of the lake can be maintained during the season of navigation within about 0.6 foot below the level adopted for regulation, under all conditions of supply heretofore recorded. Considerable changes of level due to violent winds would be temporary and infrequent, and, in the opinion of the board, would not seriously interfere with the regulation of the lake level. The current velocities in the Niagara river, below the point where the canal enters it, will not be increased by the operation of the regulating works.

"The modification of the outflow of Lake Erie proposed for the regulation of its level will not materially change the total volume of annual discharge, and will amount to only about one-fifth of the variation of the discharge for different years under present conditions. The effect of this modification upon Lake Ontario will be to slightly increase the rate of rise in the spring and make the date of maximum stage a little earlier. This will not injure the navigation interests of the lake. The board regrets that it has been unable to obtain reliable data connecting the discharge of the St. Lawrence river with the varying levels of Lake Ontario. The modification of the flow of the Niagara river which will be produced by the proposed regulating works is so small when compared with other causes of change of level that the board is of the opinion that it cannot affect the depths of the waterways receiving the discharge to any material extent.

"The effect of the regulation of the level of Lake Erie herein proposed would be to diminish the slopes of the Detroit and St. Clair rivers for any given volume of discharge and to redistribute the flow. In the opinion of the board, the result of these changes would be to raise the low water stage about 3 feet in Lake Erie, 2 feet in Lake St. Clair and 1 foot in Lake Huron. This would obviously be of great benefit to navigation. If the channel from Lake Huron to Lake Erie should be made 30 feet deep, the low water plane would be slightly lower, the difference in level probably not exceeding 0.3 foot.

"The board is of the opinion that works can be established for regulating the level of Lake Erie which will be of great value to navigation not only in Lake Erie, but also in the upper lakes and connecting waterways, and will be of no injury to the lower waterways of the lake system, and that such works can be constructed at a cost which will be small compared with their benefit to commerce. In arriving at these conclusions, the board has utilized all the information it has been able to obtain within the period covering its investigations. Additional observations are needed for more precise determinations of the probable effects of regulation upon the levels of the St. Clair, Detroit and St. Lawrence rivers, and the probable conditions of flow from the upper lakes. The board is, however, of the opinion that the uncertainties arising from this lack of complete data are fully covered by the ample provision made for varying the discharge at the regulating works. The results of observations in the St. Clair and Detroit rivers now in progress under the engineer department, United States army, will probably be available before the board submits its final report, and any new information that may be thus obtained will be introduced therein.

"Attention is invited to the fact that the project is of an international character and can only be carried out after agreement between the United States and Canadian governments."

BOAT-DETACHING HOOKS—ANSWERING GEN. DUMONT.

Editor Marine Review:—In reply to an article that appeared in the Marine Review of the 7th inst., signed James A. Dumont, supervising inspector-general, I desire to say that the report of the committee on life saving appliances of the board of supervising inspectors of steam vessels, made Jan. 7, 1894, on what is now known as the Standard automatic releasing hook, and referred to in Mr. Dumont's letter, is correct as far as it goes. A test was made and the device failed to operate as stated, owing to defects that have since been discovered and corrected. In its present perfected state it will be found on all the boats of vessels of the United States army transport service, United States navy, revenue marine service, light-house department, coast survey, and many coastwise and lake steamers. Certainly this extensive use of the device does not bear out the opinion of the committee on life saving appliances of the board of supervising inspectors of steam vessels when they reported as stated by Mr. Dumont, "that any dependence that may be placed upon such disengaging apparatus is so purely a matter of chance as to almost constitute its compulsory use a crime." On the contrary, the device has proved itself satisfactory in every respect, as daily receipts of orders from all parts of the country will testify.

Mr. Dumont in his lack of justice fails to mention a later test of the device in its present perfected condition, given (as was the test of Jan. 27, 1894, "under personal direction of Mr. Raymond") on board of the U. S. Dexter in the harbor of New York in February, 1898, before the entire board, at which he (Dumont) was present, when the Standard device was successfully lowered, detached and hooked on five times in succession, with the vessel under speed and ice making on everything to such an extent that it interfered with the operation of another device, tested at the same time, to such an extent as to make the demonstration with that device a complete and dangerous failure. Those who witnessed the operation of the Standard device at that time said it was the best demonstration they ever saw, and afer reading the meagre report of the test by the board pronounced it a great injustice to the device.

As regards the remark credited to General Grant (whose memory is revered and respected by all) some explanation is needed to show what bearing it has on the subject in hand. I am of the opinion that were General Grant at the head of the inspection service the laws would be enforced irrespective of personal interests, and in a way that would be just to all. Dodging issues by flimsy technicalities would be out of the question, and our inspection service would be something of which everyone would be justly proud. If Mr. Dumont would try half as hard to understand the operation of the Standard automatic releasing hook as he does to place it outside the terms of the law, he would see that it more than complies with the statutes, inasmuch as it is reliably automatic, or can be operated by one person disengaging both ends of the boat simultaneously, etc,, etc., as the law requires. His remarks regarding the operation of this device show that he does not understand it. It has no "forks" or "horns" and never had any, excepting the horns of the tangle he has gotten into regarding its operation and its compliance with the terms of the statutes. The releasing operation is not dependent on any lanyard whatever. If this device was operated and constructed as he says, I would agree with him that it does not comply with the statutes; but fortunately such is not the case, and I can not find words to express my surprise that a man in his position should try to maintain the stand he has taken on such a flimsy pretext. Practical men, familiar with the device, will certainly not now think him competent to judge of its utility for the purpose intended or to render a decision on the score of its compliance with the requirements. For his information let it be said that the lanyards are to aid in hooking the boat on, in hoisting it out, and all practical sailors who have performed this perilous work regard this as a most important feature of the device.

It may seem to Mr. Dumont that my interest in this matter is solely a pecuniary one, but I am quite sure that those called upon at a critical time to lower a boat for the purpose of making a rescue, or when abandoning a vessel in time of disaster, will not give thought to whose interests are affected in the means provided them to safely and successfully perform the work. The stand taken by Mr. Dumont regarding the enforcement of the law is, in my opinion, a violation of the statutes pure and simple, and I am strongly impressed with the thought that an investigation by competent persons would reveal the real cause for evasion of the law. The lack of knowledge of the device displayed by Mr. Dumont, and his unjust desire to misrepresent it, is most apparent in his reference to the accident on board the U. S. S. Alliance, and will fall far short of the unfavorable impression he intended to create. It would seem that his letter was written with a view solely to refer to this incident, no matter how far removed from the subject in question, and to say the least it is decidedly unbecoming in a public official to resort to such measures, particularly when they are so wide of the mark. As to the failure of the device at the test in January, 1894, referred to in Mr. Dumont's letter, it is well known that the most valuable inventions in use today have failed to operate satisfactorily when first tested, and have had to undergo numerous changes before they were made perfect. In this respect the Standard device is no different from others. All who are familiar with the construction of the hook well know that it would be impossible to detach the boat while it is hanging in the davits or until it is waterborne. In proof of this I will quote from a report made regarding a test of this device at the United States navy yard, League island, which report is dated Nov. 1, 1897, and signed by J. F. Hanscom, naval constructor, U. S. N.: "I have to report that I have this day, with the assistance of the executive officer of the U. S. R. S. Richmond, made such a trial of these hooks, by use of the cutter belonging to that ship, and hanging from the davits from the wharf. This cutter, with the number of men placed in her will approximate the weight of the life boat with crew. It required three men at each lanyard (six in all) to release the hooks. As an automatic releasing hook they worked well." The mode of reeving the falls would cause both ends of the boat to detach irrespective of which end struck the water first. From the published account as quoted by Mr. Dumont of the accident on board of the Alliance it would seem that but one end of the boat unhooked, leaving it suspended by the other end.

Of the many sets of these hooks now in use there is not a single instance of failure or accident. It would be well, therefore, for Mr. Dumont to inform himself as to what devices are responsible for accidents before giving out in the future inferences of the kind contained in his letter. For his information (he ought to know it himself) I submit to him the name of the device that was responsible for the accident to which he refers. It was the "Woods boat detaching and attaching apparatus," a style that was approved by the board in 1871 and disapproved in 1873. but which will be found in use today on steamers inspected and passed by the steamboat inspection service. In conclusion let me say that the Standard automatic releasing hook, which Mr. Dumont is so eager to condemn, is a device about which he seems to know very little, although it has been adopted, as shown above, by other well-managed departments of the government that are fortunately not in the political category.

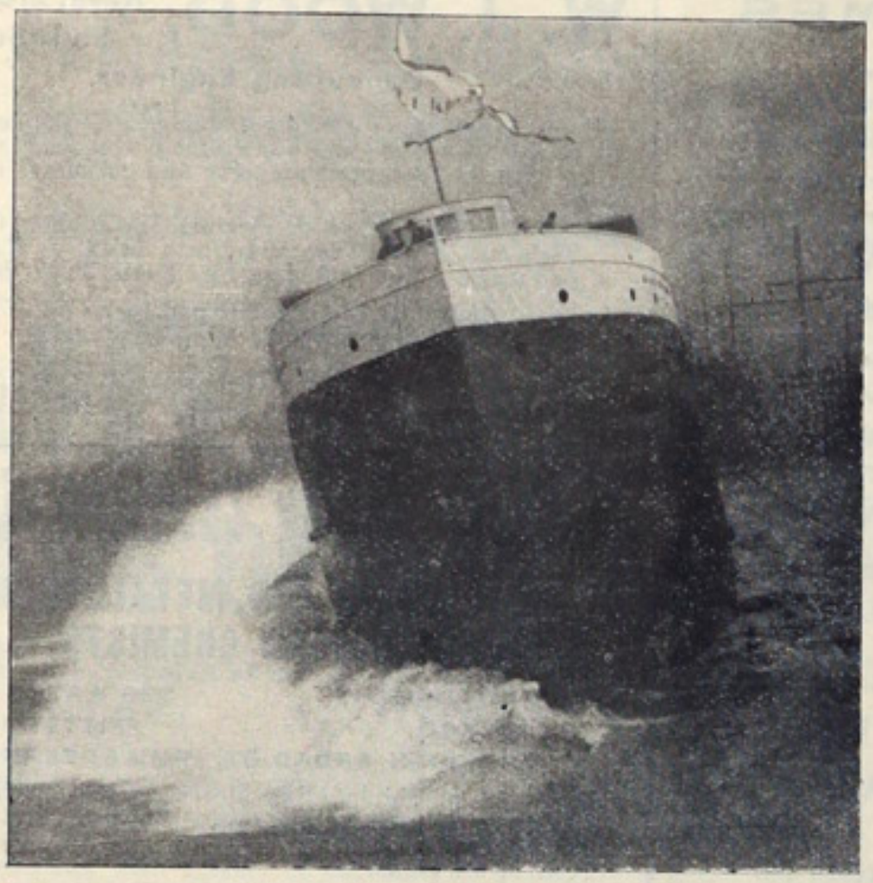
JAMES R. RAYMOND, Manager,
Standard Automatic Releasing Hook Co.
Chesebrough Bldg., 17 State St.
New York, Dec. 19, 1899.

TROUBLE WITH ANOTHER TIMBER DOCK.

Late reports are to the effect that the Port Royal dry dock is caving in and that parts of the wooden structure have rotted or been eaten away by teredos to such an extent that $500,000 must be promptly expended for repairs or it will be necessary to abandon the dock altogether. This is the latest wooden dry dock to be completed for the government. When Capt. Evans took the battleship Indiana into it in 1896, he had to wait a month for unusually high tide to get out. This was the first time the dock was used and the only other instance was during the Spanish war when a monitor was docked there. At that time it leaked so copiously that its pumps could not keep it dry and it was regarded as too dangerous for further use.

The Babcock & Wilcox Co. confirms the report circulated some time ago to the effect that they have purchased land and will erect a new plant of considerable size for the construction of boilers. The site purchased is in Bayonne, N. J., and consists of about 30 acres with a frontage of 650 feet on the Kill Von Kull, where there will be 25 feet depth of water at low tide on the outer pier line. The works will have direct connection with the Central Railroad of New Jersey. The Riter-Conley Co. of Pittsburg, has the contract for the steel structural work for the buildings, which will provide a floor area of fully 160,000 feet. The new plant will, it is expected, be in operation late next spring and will have an annual capacity of 500,000 horse power in new boilers.

LAUNCH OF A LAKE FREIGHTER.



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TRADE NOTES.

Johnson & Noyes recently opened an office at 1522 Monadnock building, Chicago, in the interests of Beaudry & Co., Boston, manufacturers of power hammers and forging presses.

M. Depuy, patentee of the Paragon water tube boiler, writes that he is sharing in the general improvement that has taken place everywhere in shipping lines, and that among recent orders for boilers of his type is one from Puget sound. His attention has been taken up largely with boats on the Erie canal, but now that navigation is closed he will be able to look after the boiler work.

The B. F. Sturtevant Co. of Boston, Mass., reports an increase of nearly 40 per cent in the volume of its business for 1899 over that of the previous year. The shipments, both foreign and domestic, included fan blowers for all purposes, heating, ventilating, drying and mechanical draft apparatus, engines, electrical apparatus, etc. During the past year an addition covering 20,000 square feet has been made for the use of the electrical department, which has shown the most rapid growth, the output having more than doubled during the year, and covering principally electric fans and special generating sets. The sale of mechanical draft apparatus has been practically quadrupled, while the output of engines has increased one-third over that of the preceding year, and has included many special designs.

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Federal Steel, Pfd*	70½	72	69	71
National Steel	34½	37½	34½	36½
National Steel, Pfd†	87¼	88¼	87¼	88¼
American Tin Plate	27	27	26½	26½
American Tin Plate, Pfd	76	76	75	75
American Steel Hoop	38	40¼	38	39½
American Steel Hoop, Pfd	76	79	76	79
Republic Iron & Steel	18¼	19	18	18¾
Republic Iron & Steel, Pfd	63	64	62½	62½

*Ex. dividend, 3 per cent.
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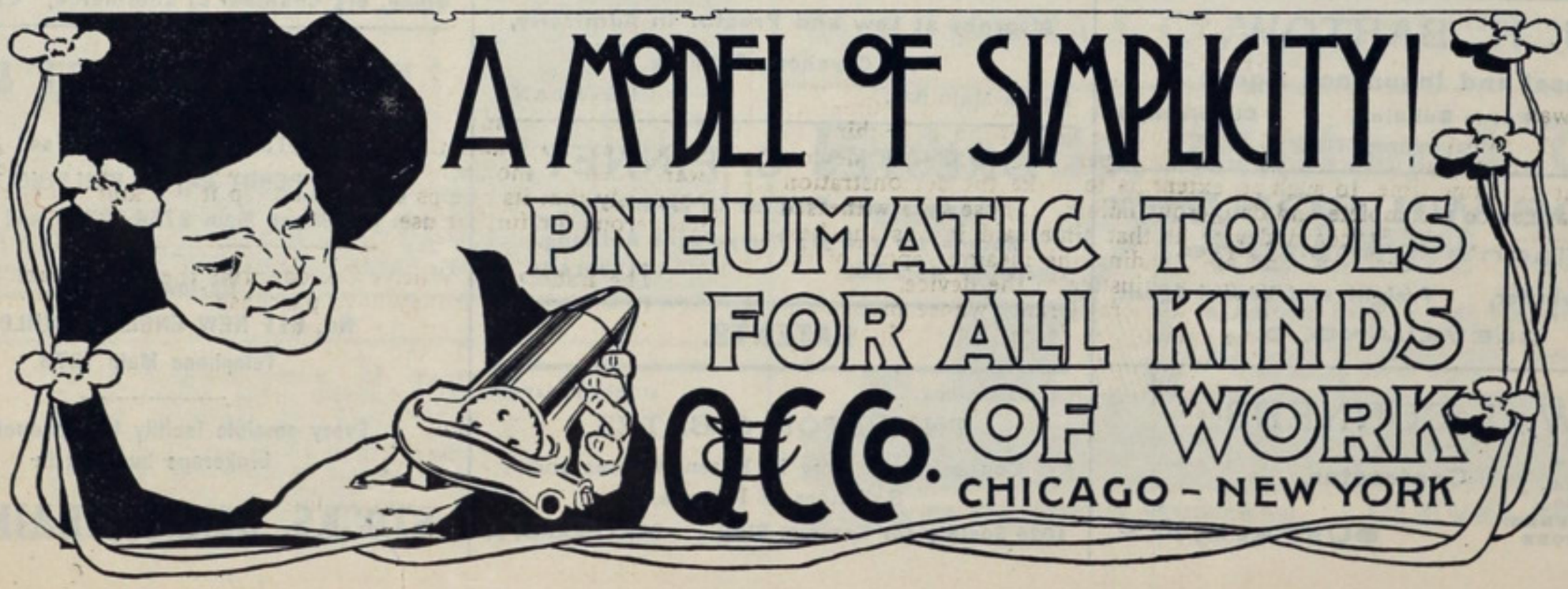

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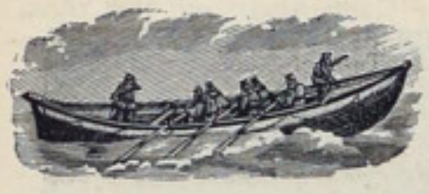

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1899	December					1899
SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

10-100 TON JACKS
1-12 INCH HAWSER
1-10
1-9

Telegraph

Capt. MARTIN SWAIN, CHEBOYGAN, MICH.

TELEGRAPH

PARKER & MILLEN, DETROIT, MICH.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., December 14, 1899. Sealed proposals for Construction of Breakwaters at Michigan City, Ind., will be received here until 3 P. M., January 13, 1900, and then publicly opened. Information furnished on application. Chester Harding, Capt., Engrs. Jan. 4.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., December 16, 1899. Sealed proposals for Pier Extension at Portage Lake, Mich., will be received here until 3 p. m., January 15, 1900, and then publicly opened. Information furnished on application. Chester Harding, Capt., Engrs. Jan. 11.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., December 18, 1899. Sealed proposals for Pier Extension at Grand Haven, Mich., will be received here until 3 p. m., January 17, 1900, and then publicly opened. Information furnished on application. Chester Harding, Capt., Engrs. Jan. 11.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., December 20, 1899. Sealed proposals for Pier Extension at Muskegon, Mich., will be received here until 3 p. m., January 19, 1900, and then publicly opened. Information furnished on application. Chester Harding, Capt., Engrs. Jan. 11.

Engineer Office, U. S. Army, 185 Euclid Ave., Cleveland, O., December 12, 1899. Sealed proposals for removal of wreck of schooner "Onward" and cargo lying near shore on north side of Port Clinton Harbor, Ohio, will be received here until 2 p. m., standard time, January 12, 1900, and then publicly opened. Information on application. Jared A. Smith, Col., Engrs. Dec. 28 & Jan. 4.

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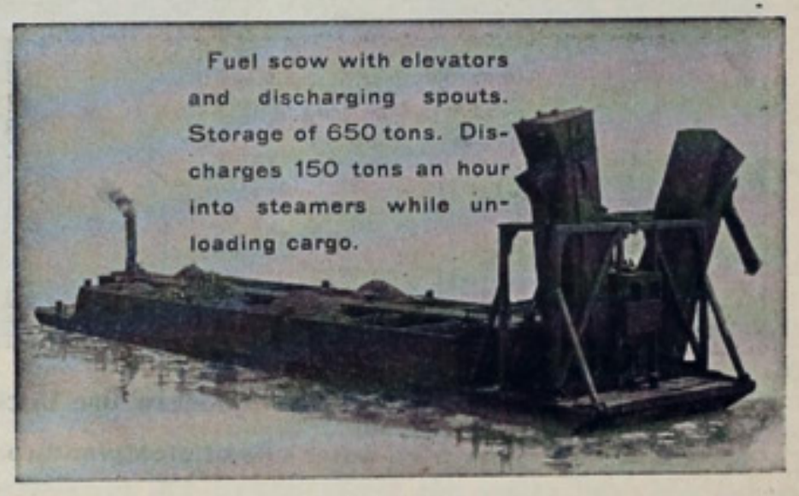

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